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you're out of the office.  
(You are, but you're not.)

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It's been shown that a more mobile workforce is a more productive workforce. When you want to unwire, turn to CDW. With access to the largest in-stock inventories, we have all the top-name mobility solutions you need. Our account managers can quickly answer your product questions. And then get your order shipped out fast. So why wait? The sooner you call, the sooner you can go mobile.

The Mobile Solutions You Need When You Need Them.



## Toshiba Tecra M2V-S330

- Intel® Centrino™ Mobile Technology
- 1.5GHz Intel® Pentium® M processor
- Intel® PRO/Wireless 2200 network connection (802.11b/g)
- CD-RW/DVD-ROM combo drive
- 14.1" XGA active-matrix display

Recommended accessories and services:

Kingston 256MB memory upgrade **\$90** (CDW 372573)

Toshiba port replicator **\$179** (CDW 577638)

Toshiba Services 3-year warranty upgrade **\$165** (CDW 289266)

**\$1199** NOTEBOOK  
CDW 624662

**-200** TRADE-IN\*

**\$999**



**TOSHIBA**

**\$93<sup>48</sup>**

CDW 548006



## Targus PORT 3.1 Commuter Case

- Fits notebooks with up to 15" screens
- Dimensions: 13" (L) x 2" (W) x 11" (H)
- Padded, non-slip EqualizerStrap™ absorbs shock and distributes weight evenly across the shoulders for greater comfort
- Includes patented SafePORT Air Cushion System for maximized notebook protection



Notebook and accessories sold separately

Eligible processors include Intel Pentium II, III or Intel Celeron; AMD processors do not qualify; trade-in values are estimates only; actual trade-in values may vary from \$25 to \$500; all products must be in good working condition and have a fair market value; call your CDW account manager for details; offer ends 3/31/05. \*215MB actual storage capacity (160MB internal flash drive, 55MB program memory for applications and data). Expansion card required, stereo headphones optional, both sold separately. †Some Microsoft Office and Powerpoint 2003 versions only. CDW is not the sole provider of the products purchased by customer hereunder and the only

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### **palmOne Tungsten™ T5 Handheld**

- Memory: 256MB<sup>1</sup>
- 416MHz Intel® Xscale processor
- MP3<sup>2</sup>, video playback<sup>3</sup> and photo software
- Create and edit files that are compatible with Microsoft® Word, Excel and PowerPoint<sup>3</sup>
- Integrated Bluetooth® technology
- Palm OS® 5.4

**\$399**

CDW 685799



**\$179**

CDW 685918

**D-Link**

### **D-Link DWL-2200AP**

- High-speed 108Mbps 802.11g wireless access point with integrated Power over Ethernet (PoE)
- Provides maximum security with 802.1x and Wi-Fi™ Protected Access
- Can be configured as an access point, point-to-point bridge, point-to-multipoint bridge or repeater
- All settings can be managed via Web-based configuration utility or Telnet



### **Netgear WGT634U Wireless Media Router**

- USB disk drive or memory stick connectivity
- Remote access to your files, MP3s and photos on the router-attached USB storage device from any Web-connected PC
- Over 10 security and privacy features including double firewall (NAT + SPI) to secure your network, PCs and files

**\$109<sup>60</sup>**

CDW 659835

**NETGEAR**

**\$36<sup>18</sup>**

CDW 648323



### **Lexar 256MB Jumpdrive Secure**

- Portable USB drive with 256MB Flash™ memory
- Includes JumpDrive Secure security software to enable password protection
- Password "zone" allows files to be secure even if someone else is using the device
- 256-bit AES encryption enables a step up from normal password protection







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instead of just watching it go.



Dell recommends Microsoft® Windows® XP Professional

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## Small Business Desktops & Workstations

### DELL™ DIMENSION™

Affordable cutting-edge technology for home or office

- Industry-leading technology • High-end peripherals
- Advanced multimedia

### DELL™ OPTIPLEX™

Corporate-Grade Desktops

- Industry-standard technology • Easy to service, manage and upgrade • Designed for a networked environment

### DELL™ PRECISION™

Corporate-Grade Workstation

- Some of the latest technology including PCIe graphics, DDR2 memory and 64 bit extension • ISV certification

### DIMENSION™ 2400 DESKTOP

**Economical, Essential Technology Desktop**

- Intel® Celeron® Processor (2.40GHz, 128KB L2 Cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- 256MB Shared\* DDR SDRAM
- 40GB\* Hard Drive (7200 RPM); 48x CD-ROM
- Integrated Intel® Extreme Graphics; Integrated Audio
- 90-Day Basic Service Plan (Ltd. Warranty,\* On-Site Service,\* 1-Yr Tech Support)
- Monitor Not Included

**\$349** E-VALUE Code: 02426-S50203m

**Recommended Upgrade:**

- 15" Dell™ E153FP Flat Panel Display, add \$249

### DIMENSION™ 3000 DESKTOP

**Ultimate Value Desktop**

- Intel® Pentium® 4 Processor (2.80GHz, 1MB L2 Cache, 533MHz FSB)
- Microsoft® Windows® XP Home Edition
- 256MB Shared\* DDR SDRAM
- 40GB\* Hard Drive (7200 RPM); 48x CD Burner
- Integrated Intel® Extreme Graphics 2; Integrated Audio
- 1-Yr Basic Service Plan (Ltd. Warranty,\* On-Site Service,\* 1-Yr Tech Support)
- Monitor Not Included

**\$549** Lease as low as \$15/mo., (48 pmts\*)  
E-VALUE Code: 02426-S50205m

**Recommended Upgrade:**

- Microsoft® Office Basic Edition 2003, add \$129

### OPTIPLEX™ GX280 DESKTOP

**Network-Optimized, Advanced Business Desktop**

- Intel® Pentium® 4 Processor 520 with HT Technology (2.80GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Professional
- 256MB Dual-Channel Shared\* DDR2 SDRAM
- 80GB\* SATA Hard Drive (7200 RPM); 48x CD-ROM
- Integrated Intel® Graphics Media Accelerator 900
- 3-Yr Basic Service Plan (Ltd. Warranty,\* On-Site Service,\* Tech Support)
- 15" Dell™ E153FP Flat Panel Display

**\$1099** Lease as low as \$30/mo., (48 pmts\*)  
E-VALUE Code: 02426-S30210m

**Recommended Upgrades:**

- 512MB Shared\* DDR SDRAM, add \$59
- Microsoft® Office Small Business Edition 2003, add \$255

### DELL™ PRECISION™ 370 WORKSTATION

**Maximum Performance, Single Processor Workstation**

- Intel® Pentium® 4 Processor 530 with HT Technology (3GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Professional
- 512MB Dual-Channel DDR2 SDRAM
- 80GB\* SATA Hard Drive (7200 RPM)
- 64MB PCI Express\* x16 NVIDIA® Quadro NVS 280 Graphics
- 48x CD Burner/DVD Combo Drive
- 3-Yr Basic Service Plan (Ltd. Warranty,\* On-Site Service,\* Tech Support)
- Monitor Not Included

**\$1299** Lease as low as \$35/mo., (48 pmts\*)  
E-VALUE Code: 02426-S40212m

**Recommended Upgrade:**

- 19" Dell™ UltraSharp™ 1905FP Digital Flat Panel, add \$599

### DELL™ PRECISION™ 470 WORKSTATION

**Scalable, Dual Processor Capable Workstation**

- Intel® Xeon® Processor (3GHz, 1MB L3 Cache, 800MHz FSB)
- Microsoft® Windows® XP Professional
- 512MB Dual-Channel DDR2 SDRAM
- 80GB\* SATA Hard Drive (7200 RPM)
- 128MB ATI® FireGL™ V3100 PCI Express\* x16 Graphics Card
- 48x CD Burner/DVD Combo Drive
- 3-Yr Basic Service Plan (Ltd. Warranty,\* On-Site Service,\* Tech Support)
- Monitor Not Included

**\$1699** Lease as low as \$45/mo., (48 pmts\*)  
E-VALUE Code: 02426-S40216m

**Recommended Upgrade:**

- 2" Intel® Xeon® Processor (3GHz, 1MB L3 Cache, 800MHz FSB), add \$499

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**\*Pricing/Availability:** Pricing, specifications, availability, and terms of offer may change without notice. Taxes, fees and shipping and handling charges, except for free shipping offer, extra, vary and are not subject to discount. May be combined with other select offers or discounts. U.S. Dell Small Business new purchases only. LIMIT 5 DISCOUNTED OR PROMOTIONAL ITEMS PER CUSTOMER. In case of customers leasing under these promotions, please note that items leased will be subject to applicable end-of-lease options or requirements. Dell cannot be responsible for pricing or other errors, and reserves the right to cancel orders arising from such errors. **Processor Speed:** Power management features limit processor speed to maintain system cooling or power requirements. **Warranty:** For a copy of our Guarantees or Limited Warranties, write Dell USA L.P., Attn: Warranties, One Dell Way, Round Rock, Texas 78682. For more information, visit <http://www.dell.com/warranty>. **On-Site Service:** Service may be provided by third-party. Technician will be dispatched, if necessary, following phone-based troubleshooting. Subject to parts availability, geographical restrictions and terms of service contract. Service timing dependent upon time of day call placed to Dell. U.S. only. **Wireless Speed:** For comparative purposes only. Actual speed varies with environment, equipment and other factors, and will be less. **Advanced Exchange Service for Projector:** Replacement system or replacement part will be dispatched, if necessary, following phone-based troubleshooting. In advance of receipt of returned defective system. Defective unit must be returned. Replacement may be refurbished. Bulbs have a 90-day limited warranty. Availability varies. Other conditions apply. **Advanced Exchange Service for Printer:** Replacement part or unit will be dispatched, if necessary, following phone-based troubleshooting. In advance of receipt of returned defective unit. Subject to parts availability, geographical restrictions and terms of service contract. Service timing dependent upon time of day call placed to Dell. Defective unit must be returned. Replacement may be refurbished. U.S. only. **Notebook Weight:** Weight varies by configuration and manufacturing variability. **Small Business Server:** Small Business Server must serve the domain controller and is limited to 75 users. **Leasing:** Monthly payment based on 48-month Fair Market Value (FMV) QuickLease and does not include taxes, fees and shipping charges. Your monthly payment may vary, depending on your creditworthiness. QuickLease arranged by Dell Financial Services L.P. (DFS), an independent entity, to qualified Small Business customers. Minimum transaction size of \$500 required. At the end of the FMV QuickLease, you can: purchase the equipment for the then FMV, renew the lease or return the equipment to DFS. Please contact your DFS representative for further details. All terms subject to credit approval and availability, and are subject to change without notice. **Advanced Exchange Service for PowerConnect:** Technician, replacement part or unit (depending on service contract) will be dispatched, if necessary.

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## Small Business Notebooks



### DELL™ INSPIRON™

**Affordable cutting-edge mobile technology for small business**

- Industry-leading technology with a range of performance options
- Advanced multimedia

### DELL™ LATITUDE™

**Network-optimized business-grade notebooks for growing businesses**

- Innovative, business-grade features to help reduce total cost of ownership • Easy to use, manage, and secure • Advanced docking solutions

### INSPIRON™ 1150 NOTEBOOK

**Notebook Essentials – Starting at 7.4 lbs.\***

- Mobile Intel® Pentium® 4 Processor at 2.80GHz\*
- Microsoft® Windows® XP Home Edition
- WordPerfect® Word Processing
- 14.1" XGA TFT Display
- 256MB Shared\* DDR SDRAM; 30GB\* Hard Drive
- Fixed Internal 8x DVD-ROM Drive
- 90-Day Basic Service Plan (Includes Ltd. Warranty,\* Mail-In Service, 1-Yr Tech Support)
- Does Not Include Serial and Parallel Ports

**\$879**

Lease as low as **\$24/mo.** (48 pmts.)\*

**E-VALUE Code: 02426-S80208m**  
While Supplies Last!

**Recommended Upgrade:**

- 2-Yr Business Standard Service Plan (Includes On-Site Service,\* CompleteCare™ Accidental Damage Service,\* 2-Yr Tech Support), add \$198

### LATITUDE™ D505 NOTEBOOK

**Business Essentials, Compact Design – Starting at 5.1 lbs.\***

- Featuring Intel® Centrino® Mobile Technology
- Intel® Pentium® M Processor 725 (1.60GHz)
- Intel® PRO/Wireless 2100 802.11b Mini-PCI Wireless Card
- Microsoft® Windows® XP Home Edition
- 15" XGA TFT Display
- 128MB Shared\* DDR SDRAM; 30GB\* Hard Drive
- Modular 24x CD-ROM Drive
- 1-Yr Basic Service Plan (Ltd. Warranty,\* Mail-In Service, Tech Support)
- Serial and Parallel Ports Included

**\$1179**

Lease as low as **\$32/mo.** (48 pmts.)\*

**E-VALUE Code: 02426-S70211m**

**Recommended Upgrades:**

- Nylon Deluxe Carrying Case, add \$59
- Additional 6-Cell Primary Battery, add \$69

## Small Business Servers



### DELL™ POWEREDGE™ SC

**Simple server computing for small business**

- Ideal entry-level choice for first-time server buyers with little or no IT support • True server performance for first server-based networks at incredibly low starting prices

### DELL™ POWEREDGE™ SERVERS

**High-performance servers for growing businesses**

- Ideal choice for growing businesses that need versatile, high-performance servers that expand with needs

### NEW POWEREDGE™ SC420 SERVER

**Small Business Value Server**

- Intel® Celeron® D Processor 325 (2.53GHz with 256KB Cache/533MHz FSB)
- Upgradable to Intel® Pentium® 4 Processor at 3.60GHz with 800MHz Front Side Bus
- 256MB ECC DDR2 SDRAM (Up to 4GB)
- 40GB\* (7200 RPM) SATA Hard Drive (Up to 500GB\*)
- Embedded Broadcom® Gigabit\* Ethernet Controller
- RAID 1 Optional
- 1-Yr Next Business Day On-Site Service\*

**\$499**

Lease as low as **\$14/mo.** (48 pmts.)\*

**E-VALUE Code: 02426-S20204m**  
Small Business Pricing

**Recommended Upgrade:**

- System Including Microsoft® Windows® Small Business Server\* 2003, now \$998

### NEW POWEREDGE™ 800 SERVER

**Value Tower Server**

- Intel® Celeron® D Processor 325 (2.53GHz with 256KB Cache/533MHz FSB)
- Upgradable to Intel® Pentium® 4 Processor at 3.80GHz with 800MHz Front Side Bus
- 256MB ECC DDR2 SDRAM (Up to 4GB)
- 40GB\* (7200 RPM) SATA Hard Drive (Up to 1TB\*)
- Embedded Broadcom® Gigabit\* Ethernet Controller
- Optional DRAC 4/P Adapter for Remote Management
- 3-Yr Next Business Day On-Site Service\*
- Small Business Pricing

**\$749**

Lease as low as **\$20/mo.** (48 pmts.)\*

**E-VALUE Code: 02426-S20207n**  
Small Business Pricing

**Recommended Upgrade:**

- PowerConnect™ 2216 16-Port Fast Ethernet Switch\*, add \$69

## Networking Options

### POWERCONNECT™ 2216 SWITCH\*

**Affordable, Plug & Play Network Switch to Enhance Your PC's Network**

- Great Solution for Small Business Workgroups
- 16 Fast Ethernet Ports; Full Wire Speed
- 1-Yr Next Business Day Advanced Exchange Service\*

**\$69**

**Recommended Upgrade:**

- 3-Yr Next Business Day Advanced Exchange Service\*, add \$19

Visit [www.dell.com/storage4mybiz](http://www.dell.com/storage4mybiz) if you have more than 300GB\* of storage, for low prices on Dell/EMC storage arrays.

## Software & Peripherals

Dell has over 100,000 brand-name products to help increase the productivity of your PC and your office!



### DELL™ LASER PRINTERS

**NEW Dell™ Color Laser Printer 3000cn, Only \$449**  
**Reliable Color Laser Printer for the Price of Black & White**

- Fast Printing – Up to 22ppm\* Black; Up to 5ppm\* Color
- Vibrant 600 x 600 dpi with 2400 Image Quality
- Up to 45,000-Page Monthly Duty Cycle
- Includes Up to 2,000-Page Yield Cartridge Black and Up to 1,000-Page Each Color (Magenta, Cyan, Yellow)\*
- Standard 1-Yr Next Business Day On-Site Service\*

\*Actual print speed will vary with use.

**Dell™ Personal Laser Printer 1700 – Only \$199**

**Dell™ Network Laser Printer 1700n – Only \$299**

**Dell™ Multifunction Laser Printer 1600n – Only \$399**

### Dell™ 2300MP Projector, only \$1499

- Lightweight and Portable at only 4.7 lbs.!
- 2300 ANSI Lumens (Max)\* Native XGA (1024 x 768) Resolution
- High 2100:1 Contrast Ratio for Outstanding Images
- Supports S, Composite and HDTV Video Inputs
- Standard 1-Yr Advanced Exchange Service\*

### FLAT PANEL MONITORS&TVS

- NEW Dell™ UltraSharp™ 1704 17" Flat Panel Monitor: only \$349
- NEW Dell™ UltraSharp™ 1905 19" Flat Panel Monitor: only \$529
- NEW Dell™ W1900 19" LCD TV: only \$849

Order online today at [www.dell.com/peripherals](http://www.dell.com/peripherals)

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following phone-based troubleshooting in advance of receipt of returned defective unit. Service may be provided by third-party provider. Subject to parts availability, geographical restrictions and terms of service contract. Service timing dependent upon time of day call placed to Dell. Defective unit must be returned. Replacements may be refurbished. U.S. only. **PowerConnect:** This device has not yet been approved by the Federal Communications Commission for use in a residential environment. This device is not, and may not be, offered for sale or lease, or sold or leased for use in a residential environment until the approval of the FCC has been obtained. **Shared Memory for Inspiron 1150, Latitude D505:** Up to 64MB of system memory may be allocated to support system graphics, depending on system memory size and other factors. **Shared Memory for OptiPlex GX280:** Up to 128MB of system memory may be allocated to support graphics, depending on system memory size and other factors. **Gigabit Ethernet:** This term does not connote actual operating speed of 1GB/sec. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required. **2300MP Projector Lumens:** Based on ANSI/NAFAM 177-228-1997 tests of 58 units, June 2004, with average ANSI Lumens 2113. Bulb brightness degrades with usage. Dell recommends replacing your bulb after 2000 hours of usage (up to 2500 hours in Eco-mode). **Hard Drive:** For hard drives, GB means 1 billion bytes; actual capacity varies with preloaded material and operating environment and will be less. **Printer Toner:** Laser monochrome print cartridge yield based on 5% page coverage; color print cartridge yield based on 20% page coverage. Yields vary with usage and environmental conditions. **Free 3-5 Day Shipping:** To qualify for free shipping, minimum purchase thresholds may apply. Call or go online for details. Free shipping is lowest cost (3-5 day ground) shipping. Continental (Except Alaska). Offer excludes online Software and Peripheral orders under \$50, all S&P orders placed by phone, and S&P orders placed in systems configurator pages. **CompleteCare Accidental Damage Service:** CompleteCare service excludes theft, loss and damage due to fire or intentional damage. CompleteCare not available in all states. Customer may be required to return unit to Dell. For complete details, visit [www.dell.com/servicecontracts](http://www.dell.com/servicecontracts). **Trademarks/Copyright Notices:** Dell, the stylized E logo, E-Value, Dimension, Inspiron, Latitude, OptiPlex, PowerEdge, Dell Precision, PowerConnect and UltraSharp are trademarks of Dell Inc. Intel, Intel Inside, the Intel Inside logo, Intel Centrino, Intel Xeon, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Adobe is a registered trademark of Adobe Systems Incorporated. EMC is a registered trademark of EMC Corporation. ©2005 Dell Inc. All rights reserved.

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**AMD Athlon™ 64 3400+**  
512KB L2 Cache  
64-Bit Processor Socket 754  
Model# ADA3400AXB0X

**\$229.00**



**AMD Athlon™ 64 3500+**  
512KB L2 Cache  
64-Bit Processor Socket 939  
Model# ADA3500AWB0X

**\$279.00**



**AMD Athlon™ 64 3700+**  
1MB L2 Cache  
64-Bit Processor Socket 754  
Model# ADA3700B0X

**\$475.00**



**AMD Athlon™ 64 3800+**  
512KB L2 Cache  
64-Bit Processor Socket 939  
Model# ADA3800AWB0X

**\$649.00**



**AMD Athlon™ 64 4000+**  
1MB L2 Cache  
64-Bit Processor Socket 939  
Model# ADA4000ASB0X

**\$735.00**

\* These model numbers indicate relative software performance among AMD processors.



#### AMD Athlon™ 64 Technology

- The only Windows®-compatible 64-bit processor
- Streamlines multitasking performance with HyperTransport™ technology, invented by AMD, which removes I/O bottlenecks, increases bandwidth and reduces latency
- Enhanced virus protection for the upcoming Microsoft® Windows® XP SP2
- Cool'n'Quiet™ technology offers performance-on-demand capability to reduce energy usage and enable a quiet environment for home computing



#### Hard Drives



**\$116.00**

**Toshiba MK6026GAX 60GB**  
5400RPM Notebook Hard Drive - OEM



**\$151.00**

**Western Digital Scorpio**  
2.5" 80GB 5400 RPM HD - OEM



**\$63.50**

**Fujitsu 20GB 4200RPM**  
Notebook Hard Drive - OEM

#### Memory



**\$528.00**

**Corsair ValueSelect Kit 240-Pin**  
2GB (2x1GB) DDR2 PC2-4200



**\$321.00**

**Kingston ValueRAM 240-Pin**  
1GB DDR2 SDRAM PC2-3200 - OEM



**\$129.00**

**Crucial Ballistix 184-Pin**  
512MB DDR SDRAM PC-4000

#### Cases



**\$203.99**

**Lian Li PC-V1000 Aluminum**  
ATX Mid Tower Case w/ Multi-Ventilator for Heat Dissipating



**MGE Viper**  
ATX Mid Tower  
UV Acrylic Panel  
w/ 500 Watts PS  
**\$98.00**



**Raidmax**  
668WBP Gaming  
w/ 420 Watts PS  
**\$95.00**

#### Optical Drives



**\$136.99**

**Plextor PX-716A/SW 16x**  
Dual Layer DVD±RW ATAPI/E-IDE



**\$69.99**

**NEC ND-3520ABK 16x Dual**  
DVD±RW ATAPI/E-IDE - OEM



**\$45.99**

**Lite-On SOHC-5235K**  
52x32x52x16 Combo Drive

## Winner of the 2004 Shoppers' Choice Award in the following categories:

- Best Overall Place to Buy Online
- Best Place to Buy Core Components
- Best Place to Buy Digital Gear
- Best Place to Buy Software



**AMD Sempron™ 2500+**  
Socket A 256KB L2 Cache  
Redefining Everyday Computing  
Model# SDA2500BOX

**\$79.00**



**AMD Sempron™ 2600+**  
Socket A 256KB L2 Cache  
Redefining Everyday Computing  
Model# SDA2600BOX

**\$90.00**



**AMD Sempron™ 2800+**  
Socket A 256KB L2 Cache  
Redefining Everyday Computing  
Model# SDA2800BOX

**\$115.00**



**AMD Sempron™ 3100+**  
Socket 754 256KB L2 Cache  
Redefining Everyday Computing  
Model# SDA3100AXBOX

**\$130.00**



**AMD Athlon™ 64 FX-55**  
1MB L2 Cache  
64-Bit Processor Socket 939  
Model# ADAFX55ASBOX

**\$989.00**

\* These model numbers indicate relative software performance among AMD processors.



### AMD Sempron™ Processor

- Top in Class. Delivers maximum performance on the applications you use most.
- Meeting the technology curve head-on. Get the productivity-enhancing performance you need for all your everyday applications.
- Any application, anytime, anywhere. Run over 60,000 of the world's most popular applications, enabling you to enjoy solid performance.



### LCD Monitors



**ViewSonic VP201B 20.1"**  
TFT Active Maxtrix UXGA LCD  
1600x1200 dpi Ultra-Slim Bezel

**\$699.99**



**Samsung 910T-Silver 19"**  
a-si TFT/PVA 1280x1024 dpi

**\$445.99**



**CTX X701A 17" TFT Active**  
Matrix Panel 1280x1024 dpi

**\$239.99**

### Networking



**Linksys Wireless G WRT54G**  
54Mbps Broadband Router

**\$59.99**



**Netgear XE102US**  
Wall-Plugged Ethernet Bridge

**\$49.99**



**D-Link DWL-G510 AirPlus G**  
High Speed 2.4GHz Wireless PCI

**\$42.99**

### Software



**Microsoft Office Professional**  
2003 w/ Service Pack 1 - OEM

**\$313.00**



**Microsoft XP Professional**  
SP2 w/ MS Plus! - OEM

**\$166.00**



**Microsoft XP Home Edition**  
SP2 w/ MS Plus! - OEM

**\$109.00**

### Inputs & Outputs



**Klipsch Promedia GMX A-2.1**  
Personal Audio System

**\$147.99**



**Altec Lansing GT5051**  
5.1 Speaker System

**\$105.00**



**Logitech Cordless Internet**  
Pro Desktop USB - OEM

**\$29.99**

>> Enter Promo Code **PCW20305** at checkout for **Free Shipping** on these items  
>> Visit [Newegg.com](http://Newegg.com) for today's prices and complete product line

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With its 1600 Lumens and \$999 list price,  
the Xerox DP 820 Digital Projector  
will make your ideas look very bright.

*There's a new way to look at it.*

High standards. Remarkable performance. That's Xerox for you. At 4.5 pounds, this lightweight Xerox DP 820 digital projector is the ultimate presentation tool for conference rooms and mobile professionals. With 1600 ANSI Lumens for brightness, typically found on more expensive projectors, support for up to 16.7 million colors and DLP™ technology, the DP 820 offers unprecedented

picture quality and color accuracy for both presentations and home theater entertainment. The DP 820 also includes a wireless remote that will allow you to zoom and adjust image quality from anywhere in the room. If you care how your image is projected, the DP 820 is the right tool to place your ideas in the brightest light. Compact. Powerful. Cost-effective.



Learn more: [www.xeroxprojectors.com](http://www.xeroxprojectors.com)

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[Insight](http://Insight)

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## WINDOWS TIPS

### 60 Windows Rejuvenated!

Want to restore the bounce to your aging Windows set-up? We present tools and techniques that strip away computer-clogging applets, unload spyware, pare down the Registry, and give your system some of Longhorn's promised prowess today.



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Cover graphics by Diego Aguirre.

# PC WORLD

MARCH 2005

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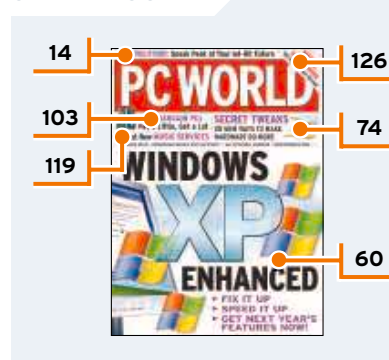
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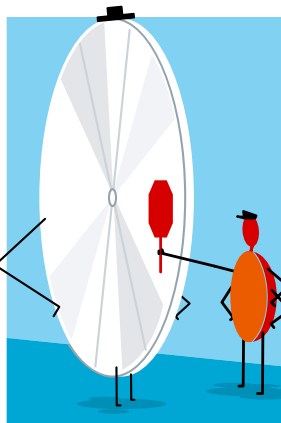
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## 64-Bit PCs: The Long and Winding Road

Next-generation computing will change the way you work and play. But when?

FUNNY THING ABOUT TECHNOLOGY REVOLUTIONS: They're almost always more evolutionary than revolutionary. With PCs, change is a given, of course. But it tends to come in bits, pieces, fits, and starts.

Case in point: 64-bit computing, the revolution-in-the-making that Paul Thurrott covers in "XP Goes to 64 Bits," this issue's lead *News and Trends* story (page 14). The 32-bit PC platform is almost two decades old now; for years, it's been clear that far more potent 64-bit technology will eventually supplant it. The only uncertainties have been nitpicky little questions such as how, when, and why.

Until lately, the road to 64-bit has felt like a series of dead ends. Way back in 1998, for instance, *PC World* wrote about satisfied users of Windows computers built around the 64-bit Alpha processor, and yet the Windows/Alpha platform quickly died. More recently, Itanium, Intel's first foray into 64-bit CPUs, has languished.

AMD's Athlon 64 processors, however, are the real deal. Operating in both 32-bit and 64-bit modes, the Athlon 64, which debuted in late 2003, is fully compatible with software written for x86 processors such as the Pentium 4. That's a key advantage over earlier 64-bit CPUs, which required all-new operating systems and apps.

Even in 32-bit mode, the Athlon 64 is one fast CPU. Small wonder, then, that systems based on it regularly land on our *Top 15 Desktop PCs* chart.

Later this year, those machines are likely to be joined by ones that use new Intel processors that also run in both 32-bit and 64-bit modes (see our report on page 16). The Apple platform is following a similar path: A G5 Macintosh is a 64-bit system that runs the 32-bit Mac OS X.



Among the applications that will benefit most from 64-bit power are video editing, DVD authoring, heavy-duty database work, and 3D gaming. All will reap rewards from 64-bit CPUs' ability to address massive amounts of RAM—theoretically up to 16 billion gigabytes of the stuff. "If you need more memory, 64-bit will be a godsend," predicts Nathan Brockwood, principal analyst at research firm Insight-64. For now, though, it'll be a pricey one: 4GB of RAM still costs upwards of \$1000.

### WAITING FOR WINDOWS

EVEN WITH PLENTIFUL RAM, a 64-bit PC running a 32-bit operating system and applications is a caged tiger: Very little of its potential is actually getting used. True, 64-bit Linux is available right now, but the vast majority of the world's desktops won't go fully 64-bit until Windows and the

applications written for it do. That's why the upcoming Windows XP Professional X64 Edition—which Thurrott test-drove for this issue's story—is so important.

For most users, however, there will be more arguments against this upgrade than for it. For one thing, XP Pro X64's changes are strictly architectural. And though it will run most 32-bit programs, most of the 64-bit apps designed to unleash its power won't show up for awhile. X64 will require new peripheral drivers, too; some won't appear right away, and others may never get written at all.

But even if you don't dive into Windows X64, developers will, as they get to work on 64-bit applications. Until now, "it's been a chicken-and-egg thing—the operating system needs to be out there," explains Brian Marr, a Microsoft senior product manager. By 2007, though, all of the pieces of the puzzle could be in place to support full-blown 64-bit computing.

Sound like a long wait? Even then, the transition won't be complete. For example, Longhorn won't be exclusively 64-bit; there will also be a 32-bit version. "The 16-to-32-bit change took a good ten years," muses Tom Halfhill, senior analyst at *Microprocessor Report*. "You have to think it's going to take another five years before [64-bit computing] is ubiquitous."

As I said, tech revolutions tend to take their own sweet time. But the best ones are worth the wait. We'll keep on monitoring 64-bit's progress in these pages—and we hope you'll be along for the ride. ■

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# NEWS & TRENDS

EDITED BY EDWARD N. ALBRO

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## XP Goes to 64 Bits

**A PRERELEASE VERSION OF MICROSOFT'S FIRST 64-BIT DESKTOP OS PERFORMED WELL IN OUR TESTS, AND PROVED SURPRISINGLY COMPATIBLE WITH 32-BIT APPS. BY PAUL THURROTT**

THE SLOW BUT inexorable march to 64-bit computing—the successor to familiar 32-bit x86-based technology, which has dominated the desktop world since the advent of Windows 95 almost a full decade ago—seems poised to speed up. Not only has Microsoft announced its plans to release its first 64-bit operating system for mainstream desktops, Windows XP Professional X64 Edition, by the middle of this year, but also the company has delivered its initial Release Candidate (RC1) of the operating system.

Microsoft has produced 64-bit OSs before, most recently Windows XP 64-Bit Edition for high-end workstations powered by Intel's Itanium



CPU, but XP X64 is the first Windows OS designed for PCs based on 64-bit CPUs that can also run today's 32-bit apps—most notably AMD's 64-bit Athlons, which have been on the market since 2003. Only

with a 64-bit OS and applications can early adopters enjoy everything 64-bit computing has to offer, including access to up to 16 terabytes of RAM. (RC1 supports only 32GB of RAM—Microsoft says that the

shipping OS will support 128GB—as well as 16 terabytes of virtual memory, but that's still vastly greater than the 4GB maximum of today's 32-bit systems.) For users, that translates into greater speed: 64-bit apps won't have to swap large data sets between memory and disk, and will therefore be able to load and process the data faster and more efficiently than 32-bit programs can.

Commercial 64-bit native applications are not yet available, so we

put RC1 through its paces with several popular current (32-bit) apps—and in general we were impressed. (Owners of 64-bit PCs can download RC1 from Microsoft's Web site at [find.pcworld.com/46490](http://find.pcworld.com/46490).)

ILLUSTRATIONS: RANDY LYHUS



Originally conceived as a stripped-down version of Windows XP (an early beta looked more like Windows 2000), XP X64 was recast early last year after Microsoft concluded that X64-based PCs were likely to become mainstream by the latter part of 2005 (see "Intel, AMD Plan New 64-Bit Desktop CPUs," page 16). Consequently, RC1 is a vast improvement over previous beta releases, offering most of the functionality of today's 32-bit Windows XP Pro with Service Pack 2 (SP2), including the Security Center and pop-up blocking in Internet Explorer. Windows XP X64 RC1 carries the 32-bit version of Windows Media Player 10, too.

Only a few technologies from today's XP are absent from the new OS. These include the 16-bit subsystem that enables DOS and 16-bit Windows applications to run, and legacy network protocols like AppleTalk and NetBEUI. "This is an opportunity to clean house on some of those items," says Brian Marr, senior product manager for Microsoft's Windows Client Group.

Because many 32-bit applications continue to use 16-bit installers, however, they can't be installed on XP X64. (Microsoft says that it's working with application makers to get 32-bit installers completed.)

### FEELS LIKE XP

IN USE, XP x64 feels quite similar to 32-bit versions of Windows—with a few noteworthy exceptions. The Start menu, for example, has two renditions of Internet Explorer:

a new 64-bit version and the same 32-bit version that Microsoft shipped in XP SP2. Why? Since 32-bit plug-ins for IE won't run in the 64-bit version, Microsoft had to retain the 32-bit version for people

cense key validation). Results were generally close to those achieved by the same desktop running XP Pro: In some cases XP Pro was a bit faster, and in others XP X64 was quicker.

In my informal tests, however, a number of applications wouldn't install, including several programs from Microsoft. Some of these were applications that historically have been written for specific versions of Windows, such as PowerToys for Windows XP (including the highly practical Tweak UI) and most major antivirus and security packages. I also couldn't install the beta of MSN Toolbar Suite and the finished version of Photo Story 3. Office 2003 SP1 did install, but only after displaying a confusing error message.

### HOW ABOUT APPS?

OF COURSE, the biggest benefits of 64-bit computing can be realized only when applications capable of taking advantage of its huge memory resources appear. Several companies have offered vague promises about developing native

64-bit programs, but concrete plans are rarely available. NewTek says it will port its Emmy Award-winning LightWave 3D graphics and visual effects package to X64 sometime this year. Epic Games has pledged to release a 64-bit version of its Unreal Tournament 2004, but this has not yet materialized. Still, the crucial factor is mainstream application support from Microsoft, Adobe, and other top-tier vendors—and they're not talking on the record (though ►

## CHIPS

# 64-BIT MILESTONES



THE ROAD TO 64-BIT desktop computing started with AMD's introduction of the Athlon 64 CPU, but the software to make it meaningful has been slow to arrive. Here are some past and projected future highlights:

- **AMD Athlon 64** desktop CPUs (September 2003)
- **Windows XP Professional X64 Edition** (Spring 2005)
- **Intel X64 Pentium 4** (Spring 2005)
- **AMD Turion** second-generation 64-bit notebook CPUs (Spring 2005)
- **Longhorn X64** (2006)

who want to keep using legacy IE add-ons, such as QuickTime or Google Toolbar.

From a performance perspective, XP X64 appears to work as well as 32-bit Windows XP Professional on the same hardware. With the OS and beta 64-bit drivers loaded on an Athlon 64-based Micro Express PC, 9 of the 13 tests in our WorldBench 5 benchmark suite ran without a hitch, and the other four failed to run only because of minor issues (most of them relating to li-

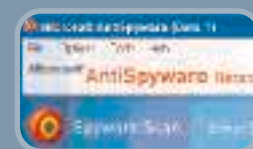
## IN BRIEF

### Product Pipeline



**NET TV:** Come spring, TV junkies should be able to get their fix anywhere, anytime as long as they have high-speed Internet access and Sling Media's \$250 Slingbox Personal Broadcaster. The device (the only one of its kind that will not charge any monthly fee) plugs into your TiVo, cable box, satellite receiver, or stereo, and converts the analog output into digital bits for streaming to a computer on the Internet. To watch, you just access Slingbox remotely, and you are ready to channel surf. [find.pcworld.com/46528](http://find.pcworld.com/46528)

### Tidbyte



**MICROSOFT VERSUS ADWARE:** Microsoft has taken its first crack at ridding PCs of spyware and adware, with the beta launch of its new Microsoft Windows AntiSpyware software ([find.pcworld.com/46488](http://find.pcworld.com/46488)). In addition to providing features like those in such rival utilities as Ad-Aware, Windows AntiSpyware can monitor a wireless network for intruders and can save and restore your IE browser toolbars and settings if they get altered.

sources at Microsoft claim that a 64-bit version of Office will appear in 2006).

Hardware device drivers are another problem. Today's 32-bit drivers won't install on XP X64; and even though RC1 includes a wide range of drivers for popular devices, the absence of third-party drivers will torment many users of the new OS. I managed to find beta 64-bit drivers for my NVidia graphics card and for my Creative Labs sound card. But 64-bit drivers for other hardware, such as an HP scanner, simply aren't available.

Generally, XP X64 shapes up as a solid addition to the XP product line. But given the problems that many users are likely to encounter when attempting to install applications and drivers on XP X64,



**WINDOWS XP PROFESSIONAL X64 EDITION looks like Windows XP, but note the two versions of Internet Explorer in the Start menu.**

we advise caution to owners of 64-bit PCs who are thinking of getting the new OS. As the adage goes, if you need it, you probably already know that you need it. This year, the most likely beneficiaries of the tran-

sition are software developers, video professionals, designers, people who use scientific applications, and others who can take advantage of X64's large memory capacity. Even they may not see much of a perfor-

mance boost, however, since most current 64-bit systems support the same amount of RAM as today's x86 PCs.

For people who do want to migrate to XP X64 when it ships, Microsoft plans to offer a Technology Exchange Program that will let customers who bought 64-bit PCs with Windows XP Pro swap that OS for XP X64. Details are still in flux, but Microsoft's Marr says the company intends to supply new Product Keys with the new OS and then deactivate the 32-bit Product Keys.

Note, though, that you will not be able to upgrade an XP Pro PC to XP X64: You can acquire XP X64 only as a clean install, which entails backing up your existing data, installing the OS from scratch, and then reinstalling your apps.

## PROCESSORS

# INTEL, AMD PLAN NEW 64-BIT DESKTOP CPUs

**WHAT'S ON TAP FOR NEW PCs?** 64-bit chips. When Microsoft's 64-bit desktop OS ships later this year, systems that run it should not be hard to find. Both AMD and—at long last—Intel plan to launch new 64-bit processors in the coming months, and later in the year each will roll out its first dual-core CPUs, which are also 64-bit.

Intel will make its first foray into the 64-bit desktop processor arena by spring, with a new line of high-end Pentium 4 CPUs based on the company's Extended Memory 64 Technology, according to Bill Kirby, the company's director of desktop marketing and strategic planning. The technology is already enabled in the company's Xeon server and workstation products. The new product line, which will come with several silicon-level enhancements, including a larger L2 cache, will carry the 600-series designation. By midyear, Intel plans to add 64-bit capabilities to its existing (and by then midrange) 500-series Pentium 4 CPUs, as well as to its 300-series budget Celeron D processors.

Though the processor giant expects to offer a top-to-bottom desktop lineup of 64-bit CPUs this year, it has no plans to market

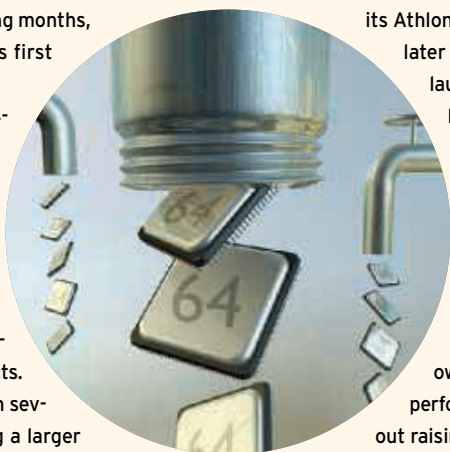
a 64-bit-capable mobile processor in 2005. The company simply doesn't see a demand for 64-bit notebooks yet, Kirby says.

AMD clearly disagrees. The chip maker, which began selling its Athlon 64 desktop CPUs in September 2003 and later added the Mobile AMD Athlon 64, is set to launch a new, second-generation 64-bit notebook CPU called the Turion by midyear. The new processor will be geared specifically toward thin-and-light notebooks, says Bahr Mahony, division marketing manager of AMD's mobile business segment.

Both AMD and Intel plan to debut 64-bit, dual-core desktop products this year. Essentially two CPUs in one, each with its own cache, dual-core processors should boost performance noticeably over today's CPUs without raising the level of heat-producing megahertz.

AMD plans to roll out its first dual-core desktop processors in the second half of the year. The company doesn't expect to offer a dual-core mobile CPU this year, however. Intel intends to launch its dual-core desktop processors sometime after midyear, and it expects to begin rolling out mobile products by year's end, with a full-scale launch in early 2006.

—Tom Mainelli







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## COMMUNICATIONS

# Manage Calls, E-Mail With One Service

## SMART BUT PRICEY SBC AND VERIZON SERVICES GIVE USERS A UNIVERSAL INBOX AND MORE.

HAVE YOU EVER wished your phone were smart enough to automatically try reaching you at all your numbers—office, cell, home—so you wouldn't miss crucial calls that went to the wrong location? That's the objective of recent services from SBC Communications and Verizon, which take advantage of the Web to offer a host of call-management and universal inbox features for standard landlines.

To access the Iobi Home service by Verizon, users log in via a desktop program or, in some cases, via the Web or a telephone. You can see a list of recent calls, schedule call forwarding, receive real-time notice of calls and voice mail coming to your home phone even when you are at the office, play back voice mail on a PC, and forward messages

as e-mail attachments. You can sync Iobi's address book and calendar with Lotus Notes, Microsoft Outlook, or Palm Desktop. Verizon users in New England (except Connecticut) and New York can subscribe now, and the service should be in more areas shortly. It costs \$8 per month.

Available to any SBC customer, the Unified Communications service lets you access e-mail, voice mail (from one landline and two Cingular wireless phones), and fax messages via the Web or by telephone; and like Iobi it permits you to forward voice mail as an e-mail attachment. It costs \$13 per month (or \$8 monthly without wireless integration).

### INS AND OUTS

WE TESTED BOTH services and found them intuitive and easy to use, with fast and simple setup. Nevertheless, we did run into a couple of glitches. Iobi constantly prompted us to upgrade to a newer version, but when we tried to upgrade, the application quit. This hap-



VERIZON'S IOBI service lets you see your recent voice-mail messages and calls, and allows you to map the location of the people who call.

pened repeatedly until we uninstalled and then reinstalled the software. SBC's service worked well, except when we tried to download e-mail from an IMAP-based Mailblocks account. It crashed, and thereafter we couldn't download mail from the account. SBC told us that this was potentially due to a corrupted e-mail and that there are some known issues with e-mail collection.

Universal inboxes are not new. Services appeared in the late 1990s promising one inbox with access to e-mail, voice mail, and faxes—but they didn't catch on. Both of today's services, however, go beyond a basic universal inbox. The killer feature, already offered by SBC and in the works from Verizon, is wireless integration with a complete find-me/follow-me service for calls, says Wu Zhou, an analyst with research firm IDC.

VoIP providers—and many phone companies—can't offer this type of wireless integration because they don't con-

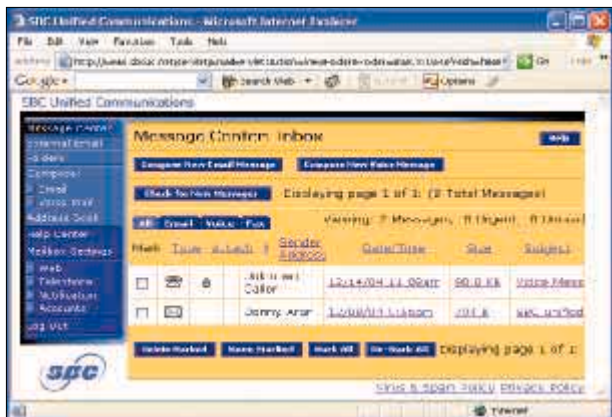
trol cellular networks and can't retrieve calls forwarded there. That points to the big catch with wireless integration: You must get your cellular service from the same company that provides your landline and call-management service.

### CALLING PLANS

VERIZON PLANS to launch a professional and enterprise version of its service in early 2005. It also intends to add new features that will let you block specific calls and view additional landlines in one mailbox, for example. SBC, meanwhile, plans to integrate its service with its upcoming consumer VoIP service, due in the first quarter of 2005.

We liked Iobi's ability to notify users at a work PC of calls to a home phone. And SBC's wireless integration is impressive. Both services are pricey, however; and for now, each seems to lack at least one feature the other already offers.

—Liane Cassavoy and  
Yardena Arar



SBC'S UNIFIED COMMUNICATIONS service allows you to view recent calls, e-mail, and faxes, and to send messages from a single inbox.



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## SECURITY

# Antivirus Tools Fool XP Security

**WINDOWS SECURITY CENTER MAY SAY YOUR PC IS PROTECTED, EVEN WHEN IT ISN'T.**

MICROSOFT'S WINDOWS XP Service Pack 2 is supposed to improve security. Its Windows Security Center should alert you when your antivirus software is missing or out of date. But in our tests, both McAfee's Internet Security Suite 2005 and Symantec's Norton Internet Security 2005 crippled SP2's ability to deliver accurate alerts immediately after installation.

We installed each application on a PC running SP2, and both caused the Windows Security Center to report er-

roneously that the products were up-to-date. Any antivirus software must be updated immediately after you install it to protect the computer against viruses discovered since the software's initial release.

McAfee and Symantec acknowledge that their products intentionally disable the Windows Security Center's messaging feature. Both companies say the reason for doing so is to streamline customers' experience; neither company plans to alter its practices.

Our advice: Grab the virus



**THE MCAFEE SECURITY CENTER under Windows XP SP2 incorrectly indicated that our test machine was fully protected, prior to updating.**

definition updates as soon as you finish installing either application. For more details, visit [find.pcworld.com/46292](http://find.pcworld.com/46292).

But the ability of antivirus vendors to tinker with SP2 raises a more ominous issue: Couldn't a smart hacker do the same? Yes, in theory, admits Yoav Schwartz, program manager for the Windows Security Center. (He also says

that no known security flaws are associated with SP2.)

Security expert Steve Gibson, president and founder of Gibson Research, says that, like Internet Explorer before it, the Windows Security Center is wide open to attack. "It's not even a matter of time," he says. "It's a matter of desire."

—Mary Landesman and Aoife M. McEvoy

## FINANCIAL PROGRAMS

# Tax Software Options for All Brackets

**CHOOSE FROM A SLEW OF NEW WEB SERVICES AND SHRINK-WRAP APPS.**

IF YOU'RE TURNING to your PC for income tax help, you'll find more ways than ever to get it this year.

Intuit has introduced SnapTax, a Web-based service for tax software newcomers who have simple returns. SnapTax ([www.turbotax.com/snaptax](http://www.turbotax.com/snaptax)) can prepare only 1040EZ or 1040A returns; it's free if you print your completed return, and it costs \$6 (Intuit's estimate) if you file electronically.

The service has a state return for California as well (the price for this form is \$10), but you're on your own for other state filings.

A newcomer to the Web-only scene, TaxNet ([www.taxnet.com](http://www.taxnet.com)) lets you prepare and print your 1040 for free. E-filing is \$10; state returns cost \$20 (including e-filing). With a \$16 bundle for federal and state e-filing, TaxAct ([taxact.com](http://taxact.com)) remains the budget option.

H&R Block's new Online Drop-off ([find.pcworld.com/46410](http://find.pcworld.com/46410)) is basically Block's traditional service but without the office visit: The customer



completes a Web-based interview, and the information is electronically submitted to a Block tax preparer. Costs start at \$80 for federal tax prep and \$30 for each state return.

On the shrink-wrap side, H&R Block Signature is a new \$100 product that—just like

its online counterpart—completes your tax forms based on a set of interview questions. The forms then go to a Block tax pro for review and filing. Block's TaxCut has a new line of \$45 Premium State products that provide more assistance than the company's standard \$25 state tax preparation software does.

Browse to [find.pcworld.com/46406](http://find.pcworld.com/46406) for reviews of leading shrink-wrap packages and go to [find.pcworld.com/46408](http://find.pcworld.com/46408) for reviews of some of the top Web-based tax preparation software offerings.

—Yardena Arar



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## ENTERTAINMENT

# Preview: Stylish Gadgets on the Go

**CAMERAS, MUSIC PLAYERS, AND DVD UNITS WILL BE SLEEKER AND MORE PORTABLE THAN EVER.**

**SMALL, PORTABLE, AND SEXY:** Mobile entertainment devices these days seduce us with their looks as well as their abilities. Hot newcomers at the recent Consumer Electronics Show included Audiovox's Shuttle System, which lets you move an LCD

with a built-in DVD player in desktop, car, or under-cabinet docking stations; Kodak's EasyShare-One camera and Giant's Tao MP3 player, which use Wi-Fi to transfer images or music; and Philips's Personal Sound System, a sort of miniature boom box.



**TAKE YOUR VIDEO EVERYWHERE:** Audiovox's Shuttle System, due in March, is based on tablet-like LCD screens with built-in DVD players that you can pop in and out of a docking station set up on a desktop (shown above), in a car, or under a cabinet. Docking stations have TV and FM radio tuners. The 10.2-inch LCD (7- and 8.5-inch models are available) runs about \$600; the desktop dock, \$200.



**PHILIPS'S PERSONAL SOUND SYSTEM** (due in April for \$160) packages a solid-state audio player with built-in speakers in a device not much bigger than a PDA. Play MP3 or WMA music files stored on its 256MB of internal flash memory, listen to its built-in FM radio, or use it as an external speaker system (Philips says that it's far more powerful than others of its size). There's even an alarm clock.



**WITH GIANT International's Tao WiFi MP3**, you can use any Wi-Fi hotspot to download tunes to the player's 20GB hard drive from subscription services that work with Microsoft's Janus copy-protection technology. The \$350 digital audio player can also play FM radio and send music to FM radios in cars or stereo systems.

**CAN'T WAIT TO SHARE** your latest digital photo masterpiece? With Kodak's new EasyShare-One digital camera, you won't have to. The 4-megapixel, Wi-Fi-equipped device enables you to e-mail pics to friends and family directly—no need for a PC. Due in June, the \$600 camera can store up to 1500 photos and provides direct access to the company's online EasyShare Gallery.





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# PLUGGED IN

STEVE FOX

## Music File Sharing Goes Legal

PLUS: AN OPEN-SOURCE OUTLOOK KILLER, AND BETTER TRAVEL SEARCH.

### LEGIT PEER-TO-PEER FILE SWAPS


 **The Buzz:** A little startup is about to make a huge splash, introducing a legal and music-industry-blessed file-swapping service. Peer Impact ([peerimpact.com](http://peerimpact.com)) breaks from the gate with a massive catalog, courtesy of the major labels (Sony BMG, Universal, and Warner; at press time, an EMI agreement was being negotiated), with plans for video, animation, and games in the works. Tunes come with a license and a key, and the system's BitTorrent-like mesh architecture breaks files into packets that can be downloaded from multiple sources and reassembled on your PC.



Pricing is the usual 99 cents per song, but users get discounts for sharing bandwidth and acting as content hosts.

**Bottom Line:** Finally! A P-to-P model that both the suits and the geeks of the world can love. This is going to be big.

### FLASHY LIGHTNING FROM MOZILLA

 **The Buzz:** The org that brought you the lean-and-mean Firefox browser is working to integrate calendar-

ing into its open-source Thunderbird e-mail app. When it's complete, Mozilla's Lightning project will support the same kind of tightly coupled scheduling that Microsoft Outlook users currently enjoy. A working cross-platform prototype (for Windows, Mac, and Linux) should become available at [Mozilla.org](http://Mozilla.org) sometime in the middle of the year.

**Bottom Line:** On the record, Mozilla developers are adamant that Lightning doesn't target Microsoft Outlook. I've also heard them insist that the Easter Bunny is real.

### TRAVEL SEARCH TAKES OFF

 **The Buzz:** Online travel agencies are so 2004. The next big thing: travel search engines. Unlike Expedia, Orbitz, and Travelocity—which maintain arrangements (and sometimes even exclusive deals) with particular airlines, hotel chains, and the like—these dedicated search engines spider a vast array of Web sites to direct you to hot deals. That means you'll receive listings for JetBlue, for instance, or an independent hotel that would not show up at Orbitz et al. Another key difference from the big three: Such search en-



### HERE\NOW

#### 1 ULTRACOMPACT STORAGE.

Seagate's USB 2.0 Pocket Drive stores 5GB in an ultrastylish, 2-inch-plus-diameter hockey puck shell for \$160 ([find.pcworld.com/46536](http://find.pcworld.com/46536)).

#### 2 MEMEORANDUM.COM.

Fresh news on the hour, plus thoughtful links to related blogs and other online commentary.

#### 3 TIVOTOGO.

This long-anticipated upgrade for Series2 TiVos permits you to copy content to your computer over a network.

#### 4 SUB-\$500 MAC.

A basic, monitorless Apple box (256MB of RAM, a 1.25-GHz PowerPC G4 processor, and a 40GB to 80GB hard drive) could lure Windows users, many of them already dizzy with love for their iPods.

#### 5 ITUNES STORE ALERTS.

TunesTracker, a free Web site, will e-mail you when new music you like hits the iTunes Music Store ([www.tunetracker.com](http://www.tunetracker.com)).

### FUTURE TECH

## Faster Cell-Phone Data



EVEN AS THIRD-GENERATION wireless technologies finally take root in the United States, telecom bigwigs are planning the mobile phone standard's next major upgrade. Dubbed Super 3G, the proposed spec promises data transfer speeds ten times faster than today's 3G services can deliver. Currently under hush-hush development by a consortium of Cingular, NEC, NTT DoCoMo, Siemens, and others, Super 3G could accelerate demand for high-speed video, interactive gaming, and the like. The initial development is expected to be completed in 2007; the target deployment date is 2009. Given the original 3G spec's infamous delays, anyone who took 2015 in the office pool is looking pretty good.

gines don't handle booking; they simply query and point.

**Bottom Line:** From veteran Sidestep to Cheapflights, Mobissimo, Kayak, Qixo, Yahoo's Fare-

Chase, and others, the field is more crowded than JFK Airport on the day before Thanksgiving.

Now all we need is a specialized search site we can use to help locate all of the travel search engines. ■

Contact PC World Contributing Editor Steve Fox at [steve\\_fox@pcworld.com](mailto:steve_fox@pcworld.com). Visit [find.pcworld.com/31643](http://find.pcworld.com/31643) to read additional Plugged In columns.



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# LETTERS

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## THE LAST REFUGE OF PC SANITY

## 'GADGETIQUETTE' LIVES—OVER THERE

## SOFTWARE GIVES SOME A VOICE



### OPTING OUT OF SPAM: IT'S A CONSUMER'S RIGHT

THANK YOU FOR YOUR article on compliance with federal antispam law ["Spam Law Test," *News and Trends*, January].

Companies that claim to be confused about how to implement the law are being disingenuous at best and are lying through their teeth at worst. They are looking for ways out of having to stop sending you spam, pure and simple.

"The law doesn't apply to us" is market-

speak for "We don't care if you don't want our stuff—we're gonna cram it down your throat anyway."

A company that respects its e-mail recipients will make it easy to unsubscribe, whether doing so is required by law or not.

This is a black-and-white issue, and the only gray areas are those created as a fog by marketers and others who want to control your inbox.

*J. Penrose, via the Internet*

### COST OF VIRUS PROTECTION

I HAVE WATCHED the price of virus definition updates rise steadily ["The Cost of Virus Protection Rises," *News and Trends*, January]. Signing up for the updates was sometimes an ordeal in itself. My neighbor recently switched to AOL's new free

antivirus service. My high-speed Internet service provider, Adelphia, is now offering a free suite with antivirus, a pop-up blocker, and more. With ISPs starting to offer these vital programs as part of their service, maybe the big dogs should start rethinking their marketing strategies. The free package is a real "suite" deal.

*Glenn Tomasov, Lockport, New York*

### CONTACTING YOUR PC MAKER

I ENJOYED JANUARY'S "Readers Rate the Manufacturers," but could you run an article showing the e-mail address or the best way to contact companies about a problem? Some companies seem to hide their e-mail addresses.

*Jim Lanigan, Philadelphia*

**Editor's response:** July's "Misadventures in Tech Support" included a table of sites and phone numbers for PC makers. Go to [find.pcworld.com/46426](http://find.pcworld.com/46426) for the list. —Edward N. Albro

### HOT BUTTON

## 'What Has Happened to Our Internet?'

WHAT HAS HAPPENED to our Internet? When I bought my first real computer back in 1997, I did not need filters to screen out any kind of unwanted software trying to invade my system. Now I have installed antivirus, anti-spyware, and antispam software, and I still risk getting junk on my PC whenever I'm connected.

It took me about three evenings recently to remove spyware programs that I discovered after my notebook became extremely slow. These programs could have damaged my notebook, as it was running quite warm. It appears that such software is being put on the Internet faster than the antivirus companies can protect us.

Scary, isn't it?

*Erwin M., Ponsford, Minnesota*

LET THE MYTH BE DISPELLED: Spyware removal tools do not work in real-world applications. They may work in a controlled environment, but not for the average computer user.

Pop-up blockers aren't the solution. They're like turning up the car radio to hide the pinging noise the engine is making.

People expect everything on the Net to be free. But someone has to pay for it—hence adware/spyware that (among other things) slow down PCs. If you want that cute screen saver of puppies pulling down the toddler's diaper, understand that your computer will suffer because of it.

If we're to see a spyware-free Internet, content on the Net must be pay as you go.

*Derek Ball, Monroe, Michigan*

### WHO NEEDS ENTERTAINMENT PCs?

HOW LONG HAVE PC manufacturers been pushing this "prearranged marriage" between computer and entertainment center ["Entertainment PCs Take Center Stage," January]? My computer is for surfing the Net! If I want to hear music, I'll put a CD in my stereo system instead of listening to PC speakers that offer so-so sound. Nor will I view a movie on my 17-inch LCD screen when I can sit in my recliner and watch it on my 52-inch HDTV.

*Matt Matherne, via the Internet*

### PC REPAIR SHOPS DEFENDED

METHINKS THAT "Adware From the PC Repair Shop?" merited closer editorial scrutiny before it became January's "Letter of the Month."

The MSN and AOL desktop icons that the letter writer saw on his repaired ►

PC were not “adware” but restored Windows shortcuts—the result of a recovery that the mom-and-pop PC repair shop may have had to do to fix the complainer’s machine. These options for services are included in the Windows operating system installed by the PC’s manufacturer following marketing arrangements with the companies, and they can be deleted.

I consider small repair shops the last barrier against computer insanity.

*Patrick Georges  
Rancho La Costa, California*

### MANNERS AND TECHNOLOGY

REGARDING JANUARY’S *Gadget Freak*, “Gadgetiquette 101”: In France passengers on the TGVs (high-speed trains) are requested to use the spaces in between compartments when talking on their phones, and many do. Also, in the subway cars of Paris signs say, “Although the person you’re talking to may be thousands of kilometers away, you don’t have

to shout.” Cell phone etiquette is much better in France than in the United States.

*Ralph Heide, via the Internet*

### TESTING POWER SUPPLIES

IN YOUR ARTICLE “Five-Minute Fixes” [January], you suggest using a tester from Antec to test the power supply if you get no power when trying to start your computer. However, some PC makers use nonstandard ATX supplies and motherboards. So a standard ATX tester is likely to tell you that a good supply is bad.

*Matthew G. Calabrese, via the Internet*

### GIVE VOICE APPS THEIR DUE

YOUR DECEMBER *Up Front* editorial emphasized the limitations of voice recognition programs, but I disagree. My stepson is a disabled dyslexic who used such software to earn a BA and to start on an MA. Without Dragon NaturallySpeaking and the editing capabilities of Word, he would have been a good diesel mechanic; now

he will be a professional mental health therapist. He has to go both ways—voice to text and then from the written word (CD textbooks, scanned pages) to the spoken word recorded on his MP3 player. He has developed his ability to understand and retain the meaning of the spoken word, as in lectures and radio broadcasts.

Many children and adults can’t read, for sundry reasons, and these programs open opportunities unavailable to them before.

*Al Szemborski, via the Internet*

PC World welcomes letters to the editor. We reserve the right to edit for length and clarity. Send e-mail to [letters@pcworld.com](mailto:letters@pcworld.com). ■

### CORRECTIONS

JANUARY’S “Entertainment PCs Take Center Stage” should have specified that the Gateway 820GM’s 5.1-channel speakers are a \$300 option.

PC World regrets the error.

#### Legal Notice

##### SUMMARY NOTICE OF SETTLEMENT

**Attention: Persons Or Entities Within The United States Who, On Or After January 1, 1999 To The Present, Purchased A New Abit Motherboard Models BE6, BE6II, BF6, BX-133, KA7, KA7-100, SE6, VH6, VH6II, VH6T, VP6, KT7-RAID, KT7A, KT7A-RAID, VL6, VT6X4, SA6R, And BX133-RAID. You May Be Entitled To Share In The Benefits Of A Proposed Class Action Settlement.**

This Notice Is Given To Inform All Potential Class Members Of A Proposed Settlement Of A Class Action Lawsuit. Please Read This Summary Notice Carefully And In Full As Your Rights Will Be Affected By The Proceedings In This Action.

NOTICE IS HEREBY GIVEN that a hearing will be held before the Honorable Ronald Sabraw of the Superior Court of California for the County of Alameda, located at Rene C. Davidson Alameda County Courthouse, 1225 Fallon Street, Oakland, CA 94612, on **June 1, 2005** at 11:00 a.m. to determine, among other matters, (1) whether the proposed Settlement of the Action on terms set forth in a Settlement Agreement dated December 3, 2004, is fair, reasonable, and adequate; (2) whether a Settlement Class should be certified; (3) whether the Court should enter the proposed final judgment; and (4) whether the application of Class Counsel for an award of attorneys’ fees and expenses should be granted.

##### DESCRIPTION OF THE ACTION

The Class Representative in this Action alleges that Abit Computer (USA) Corporation (“Abit”) manufactured, marketed, and sold various models of its motherboards containing an allegedly defective component, namely, a capacitor, which was allegedly prone to failure. Abit has denied and continues to deny these allegations and has asserted a number of affirmative defenses.

##### DESCRIPTION OF THE SETTLEMENT

The Settlement provides that Abit will repair or replace the capacitors on the affected models at no cost to the purchaser. Purchasers will receive instructions to send their motherboard(s) to Abit or its designated repair facilities and Abit will repair or replace the capacitors. All shipping costs will be paid by Abit. Abit will extend the warranty on the repairs and on the capacitors for a period of two years following the repair. For those members of the Class who have incurred direct out-of-pocket expenses in connection with the repair of a motherboard affected by a capacitor failure, Abit will reimburse such Class Members for the cost of repairs, parts, labor, and handling charges in connection with repairing affected capacitors, provided such costs are reasonable and verifiable.

##### HOW TO PARTICIPATE IN THE SETTLEMENT

If you are a Settlement Class Member and wish to participate in the Settlement, you may file a claim by visiting the Settlement website at

[www.abitsettlement.com](http://www.abitsettlement.com). The website will provide instructions on filing a claim online. Class Members who file their claims online will also be required to mail in a signature page and Proof of Purchase of one of the Abit Motherboards included in this Settlement. To request a Claim Form via mail, please mail your request to: Abit Motherboard Class Action Settlement, P.O. Box 91145, Seattle, WA 98111-9245. To request a Claim Form via phone, please contact the toll-free number for this Settlement at 1-800-275-0174.

A detailed “Notice of Pendency of Class Action, Proposed Settlement and Hearing,” which describes the Action, the proposed settlement, the eligibility requirements, the deadlines for submitting a Claim Form, and the rights and options available to Settlement Class Members, may be downloaded from the website. You may also request a copy by writing the Claims Administrator at the address above or calling the toll-free number.

##### REQUESTS FOR EXCLUSION AND OBJECTIONS

Any requests for exclusion from the proposed Settlement must be sent by mail to Class Counsel, Marc H. Edelson, Hoffman & Edelson, LLC, 45 West Court Street, Doylestown, PA 18901, and **postmarked on or before May 1, 2005**. The procedure, rights, and effects regarding exclusion are fully explained in the detailed “Notice of Pendency of Class Action, Proposed Settlement and Hearing.”

Any objections to the proposed Settlement must be filed with the Court and copies served on Marc H. Edelson at the above address and Counsel for Abit Computer (USA) Corporation, E. Patrick Ellisen of Foley & Lardner LLP, One Maritime Plaza, Sixth Floor, San Francisco, CA 94111-3409, **on or before May 1, 2005**. The procedure for making an objection is fully explained in the detailed “Notice of Pendency of Class Action, Proposed Settlement and Hearing.”

**PLEASE DO NOT CONTACT THE COURT OR THE CLERK’S OFFICE FOR INFORMATION.**

DATED: December 8, 2004.

By Order of the Superior Court of California  
for the County of Alameda.

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# CONSUMER WATCH

ANNE KANDRA

**THE NEW IBM AND THE GROWING ROLE OF CHINA**

**PRIVACY WATCH: NEW PHISHING SCAM ALERT**

**ON YOUR SIDE: MEDIA CENTER PC DILEMMA**

## Is a Chinese ThinkPad Still a ThinkPad?

What does IBM's sale of its PC group to Beijing-based Lenovo mean for you?



**ROB PERLSTEIN, a devout IBM fan, laments the company's sale of its PC division to Lenovo.**

ROB PERLSTEIN LOVES his ThinkPad. In fact, he's been so satisfied with IBM's popular notebook line—and with the company's highly rated service and support—that he owns three systems, and he's always recommended them to his friends and family members.

But now the happy relationship is over for Perlstein, owing to IBM's sale of its PC division to Lenovo Group (see [find.pcworld.com/46486](http://find.pcworld.com/46486) for details). "When I heard [about the sale], my first thought was to call IBM and say 'Don't do it!'"

recalls Perlstein, a registered nurse anesthesiologist who lives in Asheville, North Carolina. Perlstein considered snapping up one more ThinkPad before the final changeover, but decided against it. "Too many unanswered questions," he says. "Who's going to end up covering the warranty and technical support?"

Perlstein's concerns are shared by plenty of other IBM customers who are wondering what to expect after Big Blue relinquishes its PC operation to the leading Asian computer maker. Furthermore, the

IBM/Lenovo sale illustrates an important trend—the increasing prominence of the Chinese in the technology industry.

### NEW DEAL, OLD WAYS?

WHILE SOME IBM customers are taking a wait-and-see approach, others, including Perlstein, have already decided to make a break. "It won't be the same," he predicts. "The new company will want to compete on price, not quality."

IBM disagrees with Perlstein's analysis of the situation. Big Blue says that things will stay the same for existing customers—at least in the immediate future.

The sale, which makes Lenovo the third-largest PC company worldwide (trailing Dell and HP), gives IBM an 18.9 percent stake in the new company. Lenovo will relocate its headquarters from Beijing to Armonk, New York.

In the short term, if you own an IBM computer, you probably won't notice too many changes. The deal calls for IBM to continue developing, selling, servicing, and supporting its PCs, at least for now; the company also has already committed to an 18-month plan to introduce new features to its ThinkPad line.

The new company will also continue to support its Aptiva desktop line and other older systems under the original terms of service. Current product names and logos will appear on IBM's systems for at least five years; the Lenovo brand name and logo will be phased in gradually.

But of course, it takes more than a name and a logo to earn—and keep—customers. IBM has a strong reputation for service and support, and ThinkPad users tend to be loyalists who rate support ►

highly (visit [find.pcworld.com/45908](http://find.pcworld.com/45908) for PC World's Reliability and Service report).

On the support front, IBM insists that the sale will be virtually invisible to current customers. "Absolutely, unequivocally, nothing will change," promises Bill Owens, who currently serves as vice president of service and support for IBM's Personal Computing Division, and who will continue in the same capacity for Lenovo. "[Lenovo] will run under the same management, employees, and contractors as before the deal."

That means that the terms on your PC's warranty won't change. Owens notes that customers who contact tech support will call the same toll-free number (800/426-7378) and talk to the same reps in Atlanta as they did before the sale. That arrangement won't change for at least five years, he adds. And some customers may be relieved to hear that Lenovo has no plans to employ techies overseas for U.S. callers. (IBM's URL for support will also remain

the same: [www.pc.ibm.com/support](http://www.pc.ibm.com/support).)

Many experts predict that the Lenovo deal will add up to higher-quality products—and better deals to boot. Leslie Fiering, research vice president at industry research firm Gartner, says that the sale

**'Who's going to end up covering the warranty and technical support?'**

—Rob Perlstein, IBM ThinkPad owner

is simply good business. "It lets [the new company] keep operating expenses way down," she says. "Lenovo has a lot of innovative technologies to offer, and the efficiencies that will happen after the merger mean that the company won't have

to slash quality or service." And that should result in better products and lower prices for buyers, Fiering believes.

#### MADE IN CHINA—AND MORE

Some analysts see the deal as a sign of things to come, especially as the U.S. tech market tightens and China's economy grows. Former IBM engineer and Wharton Business School management professor Mark Zbaracki puts it bluntly: "This sale is symbolic of something going away: the PC business in the U.S."

Assuming that the IBM/Lenovo deal works out well for IBM and its customers, should we expect that China's increasing role in the tech marketplace is good news for U.S. consumers? Not necessarily, although it could initially bode well for bargain hunters: Analysts predict that as technology becomes more of a global commodity, prices will drop as computer companies streamline their operating expenses and duke it out to win cus- ▶

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## Devious New Phishing Attack Outsmarts Typical Defenses



YOU MIGHT THINK that you know how to protect yourself from phishing: Don't click the links in e-mail that purports to be from banks or other institutions. But that defense is no longer ironclad: Phishers have found a new way to snare data without your clicking a link.

Anyone with an inbox has seen a standard phishing attack: You get an e-mail warning you that something terrible has happened to your bank account and asking you to go to the bank's site to reenter your personal data. If you click the link in the e-mail, however, you go not to your bank but to a server run by a criminal who gathers all the data you enter. The best advice has been to ignore the link in the e-mail and instead type the URL of your bank's site into your browser. But that was then. Now—without protection—you can't even trust your browser when you type the address yourself.

Here's how the new phishing scam works. You receive an HTML e-mail message, and you open (or even just preview) the message in your e-mail client software. Windows PCs lacking one particular

Microsoft security patch (available at [find.pcworld.com/46258](http://find.pcworld.com/46258)) will run a tiny JavaScript applet as the client renders the HTML. The QHosts Trojan horse applet modifies the PC's Hosts file so that when you type in a bank's URL you actually go to a site controlled by the fraudsters. Since phishers have gotten very good at mimicking real sites, you may never know you're at the wrong one.

Spybot Search & Destroy ([find.pcworld.com/42052](http://find.pcworld.com/42052)) lets you "lock" the Hosts file, preventing any other program from changing it. The Options tab in WinPatrol ([find.pcworld.com/45220](http://find.pcworld.com/45220)) causes that program to pop up a dialog box if software attempts to change your Hosts file. And in the paid ZoneAlarm Pro firewall or ZoneAlarm Security Suite, you can enable an option in the Privacy Settings menu called Hosts File Protection that both locks the Hosts file *and* alerts you when something tries to change it.

While the impact of QHosts has been limited so far, phishers are likely to use this new technique much more in the near future. The fact that the Hosts file is easy to protect will be cold comfort to future victims who get hit with the next QHosts-like phishing scam.

—Andrew Brandt

ILLUSTRATION: MARK MATCHO

**WHEN THEIR  
FAVORITE  
SPORTS BAR  
BECAME A  
"SMOKE-FREE  
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## ON YOUR SIDE

## No Upgrade for Media Center PC

**I** PURCHASED A Gateway Media Center 610XL eight months ago with the assurance that any upgrades to the operating system after purchase would be free. Gateway is now claiming that Media Center 2005 isn't an upgrade, but an entirely new OS. Gateway says that the only way to get Media Center 2005 is to purchase a new Media Center PC, despite the fact that the company isn't selling any at present. What can I do?

*Brendan McGarvey, Pearl River, NY*

*On Your Side* responds: When I contacted Gateway, the company stood by its policy that Media Center 2005 is a "completely new operating system and will not be available for upgrades." However, an OEM version of the operating system is offered for purchase at online retailers like Directron ([find.pcworld.com/45950](http://find.pcworld.com/45950)) for \$130. For more details, read the Today @ PC World blog entry by Senior Associate Editor Eric Dahl at [find.pcworld.com/45946](http://find.pcworld.com/45946).

*—Stephanie Layton*

tomers in a dwindling domestic market.

The bad news? The shift could eventually take a toll on the quality of products and service. "It's a double-edged sword," admits Fiering. "As the U.S. PC market gets squeezed, vendor price wars could force companies to cut back in areas [such as

product innovation, service, and support] that will come back and hit them later."

If you're pondering another tech purchase, how can you be sure you're buying from a company that will still have a state-side address when you call a year or two down the road? Of course, there are never

any guarantees that the company you buy from won't pull up stakes and head overseas, but you can take steps to make sure you don't get left behind.

It's old advice, but it bears repeating: Learn as much as you can about the tech company you're planning to buy from. Do a little research on the company's financial health (sites like [www.hoovers.com](http://www.hoovers.com) offer financial reports for a fee), and check out tech support first-hand before you make your purchase by contacting the company directly. And it wouldn't hurt to brush up on your Chinese. ■

*Anne Kandra is a contributing editor, Andrew Brandt is a senior associate editor, and Stephanie Layton is an editorial assistant for PC World. You can send them e-mail at [consumerwatch@pcworld.com](mailto:consumerwatch@pcworld.com). To read previously published Consumer Watch, Privacy Watch, or On Your Side columns, visit [find.pcworld.com/31703](http://find.pcworld.com/31703), [find.pcworld.com/31706](http://find.pcworld.com/31706), or [find.pcworld.com/31709](http://find.pcworld.com/31709), respectively.*

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## Stay Secure at Home and on the Road

**A fingerprint reader and a flash drive will keep your private things private.**

YOU CAN CALL ME paranoid, but I can't sleep unless the files on my PC are guaranteed private, whether from visiting relatives or our house sitter. And I'm just as freaked about leaving traces behind after using someone else's PC. But I'm sawing logs now since I found some surefire ways to keep my data from prying eyes.

I'm fascinated with the idea of a PC that won't work until it has positively identified me. But I'm too cheap for the high-end security stuff. Good thing I found APC's \$40 Biometric Password Manager ([find.pcworld.com/45902](http://find.pcworld.com/45902)). The device looks like a tiny mouse and connects to my USB port (1.0, 1.1, or 2.0). Once the unit reads and stores my fingerprint, I'm the only one who can log on to the PC. But if, for example, my teenage niece visits, I simply add her and restrict her access to specific applications and files. Each scanned user (up to 20) can enter a password for, say, Web sites or accounting software and, afterward, they merely touch the device to be granted access. All users can also encrypt their files and folders using their fingerprint as the password.

### SAFE SHARING

MY TWO DOGS HAVEN'T tried using my PC yet (they prefer their Macs). But most people do have to share their PC with someone, though maybe not someone with four paws and a wet nose. If you regularly share a system with family, friends, and coworkers, you might need a more comprehensive privacy solution: Micro Solutions' LockBox Fingerprint Access Hard Drive ([find.pcworld.com/45905](http://find.pcworld.com/45905)).

The external device works with USB 1.0, 1.1, and 2.0, and it gives you fingerprint authentication for up to eight users. You can slice the drive into a maximum of seven private partitions; this way you can let some users access every area of the drive and restrict others to specific partitions. The 80GB model costs about \$185 online and runs at a speedy 7200 rpm.



Last summer when my wife, Judy, and I vacationed in Alaska, we stayed with friends and at B and Bs. No way was I going to risk domestic tranquility by taking a notebook computer along with me. Instead I used a USB flash drive to protect my privacy while I checked e-mail and browsed the Web on a hotel PC, at a public library, and once at an Internet café. I didn't leave so much as a trace of data on any of the public computers—no e-mail, passwords, or browsing history.

The drive I use is the StealthSurfer ([find.pcworld.com/45907](http://find.pcworld.com/45907)), which comes with a special version of Netscape 7 embedded.

The device works with Windows XP, 2000, and Me. It's fast because it doesn't need the host PC's browser or e-mail program. Just plug the StealthSurfer into a USB port, log in (depending on your Internet connection, the drive may take 20 seconds to authenticate itself), and you're good to go. I use Netscape to access Yahoo Mail, but it works with any Web-based e-mail program. It's pricey at \$100 for 128MB, but that may be money well spent to guard your privacy. And for the super-paranoid, the StealthSurfer provides built-in e-mail encryption.

### PRIVACY TO GO

THE STEALTHSURFER'S handy to take everywhere because it's tiny. Without a traditional—and unnecessary—plastic case, it's as thin as a dime, under 2 inches long, and three-quarters of an inch wide. I carried the gadget in my wallet throughout Alaska.

If you already have a flash drive, try the \$30 P.I. Protector Mobility Suite from Imagine

LAN ([www.imaginelan.com](http://www.imaginelan.com)). Unlike the StealthSurfer, the program uses the version of IE, Outlook, or Outlook Express that's already on the host PC. But P.I. Protector tricks the host computer into thinking the apps are on the flash drive—behind the scenes, the utility temporarily changes the location where these applications look for data and settings.

I'd better get my StealthSurfer ready. Judy's set her sights on Costa Rica. ■

*Contributing Editor Steve Bass is the author of PC Annoyances, published by O'Reilly. Contact him at [homeoffice@pcworld.com](mailto:homeoffice@pcworld.com).*



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# BUGS & FIXES

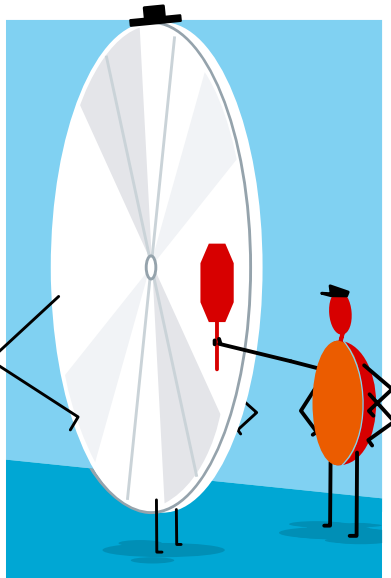
STUART J. JOHNSTON

## More Snags in Windows XP Service Pack 2

One of the flaws could reduce the write speed of many common DVD drives.

THE PC WORLD Test Center staff has discovered two bugs involving Windows XP's Service Pack 2. One can reduce the write speed of many dual-layer DVD drives. The other can decrease the battery life on some Acer laptops by an hour.

Staffers were testing dual-layer DVD drives when they found that InCD4 DVD-burning software, by Nero AG (formerly Ahead Software AG), performed up to 40 percent slower than competing applications (such as Roxio's Drag-to-Disc) on systems running SP2. InCD4 ships with many drives, including those from Lite-On, Plextor, and Sony.



Nero developers say that the glitch is due to a cache problem in SP2 and affects InCD prior to release 4.3.7.3. To check your version, open the

program and select *About*. If your app is affected, get the InCD Update-Package 3 at [find.pcworld.com/46414](http://find.pcworld.com/46414). The fix bypasses SP2's cache management problem.

Microsoft is working on a hotfix that wasn't yet available at press time.

### BATTERY DRAIN

THE TEST CENTER staff ran across another SP2-related problem while testing Acer Travelmate 3200 notebooks. The systems running XP SP1 provided up to nearly 4 hours of battery life, while laptops with SP2 ran about an hour less. (The lab didn't encounter this issue on models from other manufacturers.)

After swapping laptops and batteries, checking Acer's power-management settings, and reloading SP2, the only common element our lab analysts could find was that the notebooks with SP2 were those with shorter battery life.

In Acer's own, different tests, the company's results didn't match *PC World's* findings. Microsoft says it has heard nothing about battery problems under SP2. ■

*Stuart J. Johnston is a contributing editor for PC World. Visit [find.pcworld.com/31580](http://find.pcworld.com/31580) to see more Bugs and Fixes columns.*

### IN BRIEF

#### SP2 Patch for FireWire Glitch

MICROSOFT HAS recently released a fix for the way Windows XP Service Pack 2 handles FireWire connections. The SP2 glitch could radically reduce the download speed of devices (such as digital video cameras) connected to a PC via FireWire. You can get the patch at [find.pcworld.com/46420](http://find.pcworld.com/46420).

#### Security Fix for Opera Browser

BUG HUNTER Andreas Sandblad recently found a security hole in the Opera browser that could let a malicious cracker disguise an attack program (say, an .exe file) under a fake, safe-sounding file name (using a .pdf extension for a purported Acrobat file, say) in the download dialog box, thus tricking victims into downloading it. Versions 7.54 and earlier are vulnerable. For more information and to download the updated Opera 7.54u1, head over to [find.pcworld.com/46422](http://find.pcworld.com/46422).

### BUGGED?

FOUND A hardware or software bug? Tell us about it via e-mail at [bugs@pcworld.com](mailto:bugs@pcworld.com).

### STOP WINDOWS FIREWALL DATA LEAKS

IN DECEMBER, I told you about a security flaw in SP2 that our sibling publication, *PC Welt*, had found. The problem involves the scope of what SP2's Windows Firewall considers safe territory when using a dial-up connection. That is, even though you have the firewall turned on by default, it may still be letting everything in as exceptions to the rules because of how the firewall is configured. (For the earlier article, go to [find.pcworld.com/46416](http://find.pcworld.com/46416).)

Microsoft has now released an update for SP2 (available at [find.pcworld.com/46418](http://find.pcworld.com/46418)) that reconfigures the troublesome firewall settings and restores the safety of your files. However, the company has not publicized the update—it simply made the fix available on the Windows Update site without any formal announcement. For a problem that's potentially as important as this one, Microsoft's security team should make a lot of noise when it ships a patch. Many users don't blindly trust automatic updates. So if they don't know about a new one, chances are they won't get it.

ILLUSTRATION: FELIX SOCKWELL

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I was pleasantly surprised that tech support got back to me quickly and their answers were courteous, accurate, and succinct. Great!

- Alan

I am very impressed with how fast you got back to me, I feel great knowing that I can e-mail you with a problem and know that I will receive a response within minutes.

- Susan

I can say without reservation that I have never received better support. Everything you did was timely and error-free.

- Bob

I just wanted to tell you how pleased I am with the software, training, and speed. It was much easier than I thought, and I could not be happier! Thanks!

- David

I'm really impressed with the fast service you guys provide and the polite way you deal with what must seem very basic questions to you. Brilliant service! Thanks!

- Sarah

I now have a few sites with you guys and believe me, I know the quality of your service, and it is a pleasure dealing with you. Your company is tops. Thanx again.

- Dusty

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# NEW PRODUCTS

EDITED BY TOM MAINELLI

## Affordable Digital SLRs Arrive

We test the latest sub-\$1000 digital cameras from Olympus and Pentax, and like what we see.



**THE OLYMPUS EVOLT E-300** has a unique body style and offers 8.1-megapixel images.

### DIGITAL CAMERAS

DIGITAL SINGLE-LENS reflex cameras aren't exactly mass-market yet, but they're getting there rapidly. A little over a year ago, Canon shipped the first affordable digital SLR: its breakthrough sub-\$1000 EOS Digital Rebel. Nikon followed with its slightly more expensive D70—a great boon to every longtime Nikon film SLR owner with a bag full of lenses. Now Olympus and Pentax have joined in.

The Olympus **Evolt E-300 Digital SLR** (\$1000 with lens) and the Pentax **\*ist DS** (\$900 with lens) both come with a slew of creative controls and

can take dazzling images. Digital photographers looking to move beyond a simple point-and-shoot model likely won't be disappointed by either camera, but each one has distinct strengths and weaknesses.

The Olympus is easily the more eye-catching of the two. There's no hump on the top of the camera because Olympus repositioned the viewfinder's optical path to the left side of the body, which makes the E-300 slightly shorter than most other digital SLRs. Our shipping unit has a polished look and feel. Its solid, bricklike body feels as though you could pound nails with it. The dials

turn easily, and the body fits firmly in two hands.

The Pentax has a more traditional SLR shape, though its overall body is smaller than those of most digital SLRs. For any photographer who already owns a Pentax film body and late-model lenses, the unit provides an obvious transition to digital. Our shipping model isn't as finely finished as the E-300 (its dials are stiffer and its controls aren't as sophisticated, for instance), but its black body looks more professional than the silver Canon EOS Digital Rebel's casing.

### COMPLEX CONTROLS

THE OLYMPUS has the edge on specs: It includes an 8.1-megapixel CCD, whereas the

Pentax, like the Canon EOS Digital Rebel and Nikon D70, has a 6.1-megapixel CCD.

Both cameras will serve photographers of any skill level—convenient on occasions when you have to hand your camera to someone who's comfortable only with point-and-shoot controls. In addition to offering full-automatic exposure mode, both cameras have a selection of preset scene modes that quickly adjust your settings to specific situations. The Pentax has seven on its mode dial, while the Olympus provides five on the dial and another nine in the menus.

In the past we've praised Olympus cameras for their intuitive menus, but the E-300 takes a slight step backward. The submenus are not as well labeled as those of the Olym-

**THE PENTAX \*IST DS has a small body, but you can still use it with the numerous existing Pentax SLR lenses.**





**44 DIGITAL CAMERAS**

Olympus EVolt E-300, Pentax \*ist DS

**46 LASER PRINTER**

Konica Minolta Magicolor 2400W

**NETWORKING**

Axentia Net-Box H-70

**48 UTILITY SOFTWARE**

F-Group Software Absolute Startup Pro

**WIRELESS NETWORKING**

 Canary Wireless Digital Hotspotter,  
Smith Micro QuickLink Mobile Wi-Fi  
Seeker, Kensington WiFi Finder Plus

**50 GRAPHICS CHIPS**

 ATI Radeon X850 XT Platinum Edition,  
NVIDIA GeForce 6200 with TurboCache

**52 E-MAIL CLIENT**

Mozilla Foundation Thunderbird 1.0

**STORAGE**

Wiebetech TrayDock

**54 PORTABLE AUDIO PLAYER**

Gateway MP3 Photo Jukebox

**ONLINE BACKUP**

 Acpana Business Systems  
Data Deposit Box


54

pus C-8080 we've tested previously, and working out the location of the camera's many settings takes some time. Unfortunately, the menus on the Pentax aren't much better—there are just fewer of them.

On the plus side, the Olympus responded more quickly while we used it. Many of the key exposure controls change rapidly with the press of a dedicated button and a spin of the camera's selector dial. We especially liked the status screen on the E-300's 1.8-inch LCD. Its blue letters on a black background were easy to read, and Olympus tied the display in nicely to the camera controls.

**NOT QUITE AUTOMATIC**

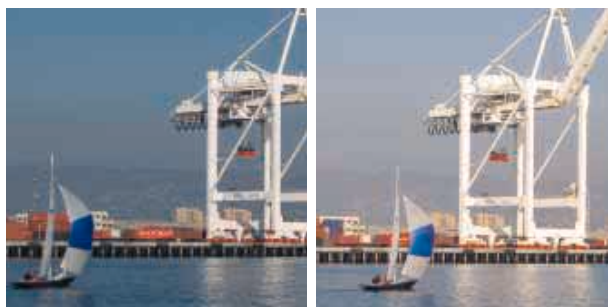
OUR FORMAL image-quality tests involve shooting pictures in the camera's default fully automatic mode. It's a good test of a camera's ability to capture details and accurate color, before you begin introducing

your own exposure-correction preferences to the mix.

In most tests, the Olympus's images were much like those we got from Nikon's D70 and Canon's semiprofessional EOS 20D: a bit underexposed, with colors slightly less saturated than the hues of the original subject. (Some digital photographers prefer default settings that produce slightly underexposed images, since this allows them to make adjustments on a PC without losing details.)

In full-auto mode, the Pentax produced more-accurate exposure values than did the Olympus camera. Colors appeared bright—even slightly oversaturated, in some cases. It captured pure whites and neutral grays especially well.

In our test target photo, the 8.1-megapixel Olympus reproduced better fine-line details than the Nikon D70—in fact, its output was comparable to that of the considerably more



**IN BRIGHT LIGHT**, the Olympus E-300's shots, like the one on the left, had more fine-line details but were a bit underexposed. Pentax's \*ist DS showed better exposure accuracy but slightly oversaturated colors.

expensive, 8.2-megapixel Canon EOS 20D. Shots from the Pentax were noticeably coarser than those from the Olympus and a bit less sharp than those from the Nikon D70, another 6.1-megapixel camera.

The Olympus also has an edge over the Pentax when it comes to burst shooting. Capturing images in its second-best JPEG setting, the EVolt fired off a steady 2.5 frames per second, ceasing only when space ran out on its CompactFlash card. Burst mode on the SD Card-based Pentax was less consistent, with a frames-per-second speed that revved up and down, but on average the \*ist DS managed 1.5 fps.

**THE LENS FACTOR**

IF THE OLYMPUS has a liability, it's the fact that the EVolt is a completely new SLR model that requires specific lenses.

Unlike competing cameras from Canon, Nikon, and Pentax, it has no massive base of existing 35mm film camera lenses from which to choose.

The Pentax does have one distinct advantage: batteries. While most cameras, including the Olympus, require that you use proprietary rechargeable batteries, the Pentax relies on two disposable CR-3Vs or four standard AAs. Consequently you can buy your own rechargeable batteries, and in a pinch you can find replacements virtually anywhere.

After two days of head-to-head shooting, I lean toward the Olympus. Much of that comes down to personal preference, though. I like the overall feel of the E-300 and its controls, plus I generally preferred the images it produced over those the Pentax shot.

—Tracey Capen

**EVolt E-300 Digital SLR**

Olympus

★★★★★

This rugged, fast, 8-megapixel SLR is hard to beat—unless you're sitting on a stash of old film camera lenses.

Street: \$1000 (kit with 28mm-to-110mm zoom lens, 35mm equivalent)

[find.pcworld.com/46384](http://find.pcworld.com/46384)

**\*ist DS**

Pentax

★★★★★

A no-brainer if you own Pentax lenses, this smallish camera shot well in full-auto mode, but its smaller-size CCD is a drawback.

Street: \$900 (kit with 27mm-to-83mm zoom lens, 35mm equivalent)

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## Minimalist Printer Offers Quality Color

### LASER PRINTER

WITH ITS TINY size and tiny price—the lowest we've seen yet for a color laser printer—the \$399 Konica Minolta **Magicolor 2400W** fits easily into any home office that often needs to produce full-color documents. Simplicity is the key to this attractive color laser, from its two-button control panel to its uncomplicated software.

#### Magicolor 2400W

Konica Minolta  
★★★★★

Great for personal use, this low-price printer produces attractive color documents.

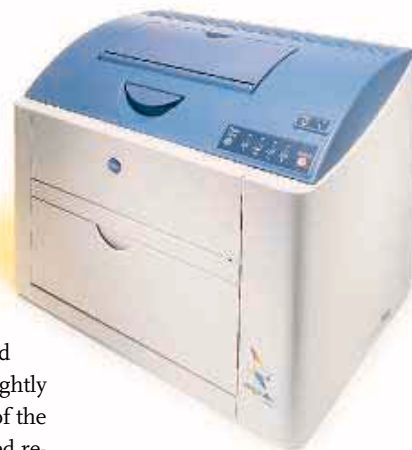
Street: \$399

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To achieve this simplicity, the 2400W depends on your computer's CPU to render the pages, allowing the printer to use less memory and a cheaper processor of its own. This USB 2.0 printer works only with Windows PCs, not Macs. Plus, it lacks integrated ethernet and support for Windows printer sharing, limiting its appeal for small businesses.

Its single 200-sheet paper tray further restricts its appeal: Though that quantity will suffice for most home users, it may not be enough for a business. And with the 2400W, unlike with many other color lasers, you can't buy larger paper trays or a duplexer.

Nevertheless, the shipping 2400W that we tested proved a tremendous performer. It churned out text at 13.6 pages per minute and graphics at 3.2 ppm—slightly above the average mark of the color lasers we have tested recently. Print quality was outstanding, beating that of printers several times its price. We saw nice, sharp text, and even diminutive fonts were legible. It deftly handled our challenging line-art test, showing no evidence of banding. Photographic images were a little grainier than we usually see from laser printers, and the dark areas of our color image



**THE MAGICOLOR 2400W** from Konica Minolta offers superb laser printing at good price.

did lose some detail. However, color accuracy was excellent.

If you have modest paper demands, the new Magicolor 2400W is a good, economical choice for adding a splash of color to your printing.

—Paul Jasper

## Inexpensive Net-Box Stumbles on Setup

### NETWORKING

WHEN YOU LOOK at lots of technology products, you start to get suspicious of anything that promises to do too much. So imagine my skepticism about Axentra's \$500 **Net-Box H-70**. Here's just a partial list of the Net-Box's features: network storage device, print server, wireless router, Web server, e-mail server, and photo-sharing site. Oh, and it doesn't care whether you use a Windows, Mac, or Linux computer.

Impossible, right? Well, not exactly. The Net-Box mostly delivers on its promises. The problem is that Axentra

doesn't make setting up all this stuff any less complicated than it sounds. And after a few hours of struggling to get things to work, I started to wonder whether I really wanted the task of con-

figuring my own Web server.

The shipping Net-Box I tested was essentially a dedicated Linux PC with an 80GB hard drive, two ethernet ports, and an integrated 802.11g Wi-Fi access point. The unit comes with one year of free domain hosting by registrar TZO.com so that you can use the Net-Box to serve your own site.

The Net-Box includes a wizard for setting up the whole system, but the wizard too often provides insufficient information, or abandons you outright, at critical junctures. For instance, in setting up the connection to my DSL account (Net-Box won't work with dial-up), the wizard presented me with four options, but no clear explanation of which one might apply to my situation. And

after I set up my new domain, the wizard finished, without pointing out that—in order to use the domain—I would still need to enter the name into more than a dozen other administrative screens.

For someone who's interested in an Internet Swiss army knife—and willing to commit to a difficult learning curve—the Net-Box could be useful. But if you're looking for convenience, you'll probably have an easier time with individual pieces of hardware or with Web services that handle the specific tasks you most need.

—Edward N. Albro



**AXENTRA'S NET-BOX H-70** offers network storage, a wireless router, an e-mail server, and more.

#### Net-Box H-70

Axentra  
★★★★★

Linux-based box promises the world, but setup proves much too complicated.

List: \$500

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©2004 Oki Data Americas, Inc. OKI Reg. T.M., Oki Electric Industry Co., Ltd., Single Pass Color Reg. T.M. Oki Data Corporation. *Better Buys for Business* Editor's Choice 2004 award applies to the C5100n, C5300n, C9300 and C9600den OKI color printers. *PC World* Top 10 award applies to C5100n, C7300n and C9600den OKI color printers. <sup>1</sup>Based on equipment, toner, image drums and maintenance costs over 3 years for color printers at 2,000 pages per month with 15% coverage. <sup>2</sup>Published performance results are based on laboratory testing; individual results may vary. For more detailed information on this comparison between the Hewlett-Packard 4650 Series, Lexmark C762 Series, Konica Minolta Magicolor 5430 DL and OKI C7350/C7550 visit [www.okidata.com/business](http://www.okidata.com/business).

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## App Stops Startup Irritation

### UTILITY SOFTWARE

PROGRAMS THAT launch automatically when you start your PC can be handy, but a growing number of apps place themselves in your startup routine whether or not you want them, and getting rid of them can be a difficult task.

F-Group's **Absolute Startup** software promises to help you

#### Absolute Startup Pro

F-Group Software

★★★★★

Solid tool for managing system startup, but it can't beat every type of spyware you'll encounter.

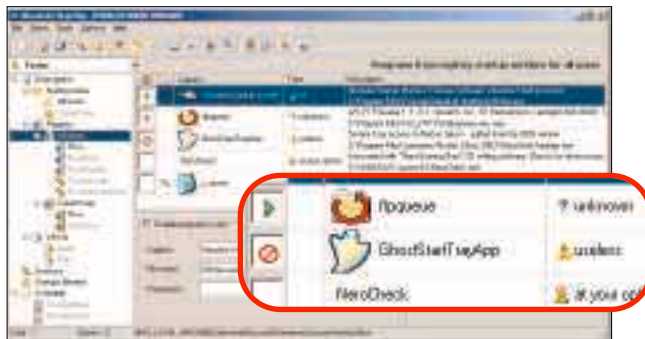
Street: \$30

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manage your PC's startup process, and to protect it from startup viruses and spyware. I installed a shipping copy of the \$30 Pro version on a PC laden with spyware and put it to the test, with mixed results.

When you launch the program, the app labels startup items as Harmful, At Your Option, Unknown, or OK.

However, the utility bases its labeling on a text match with entries in its database. Because malicious programs often use the same names as legitimate software, this leaves plenty of room for error. Even worse, Absolute Startup's optimization wizard automati-



**ABSOLUTE STARTUP PRO** monitors the apps in your startup routine.

cally deletes any startup items deemed Harmful, and so has the potential to neuter perfectly legitimate programs.

In my informal tests I found the app fairly effective at stopping less-embedded programs such as WhenU and Hotbar. Unfortunately, it was unable to stop the wily spyware Huntbar, which fooled it with frequent Registry changes.

When it comes to dealing with basic startup pests, such as Windows Messenger and Real's RealPlayer, the software works quite well.

Absolute Startup doesn't defeat all spyware, but it could be useful as part of a multi-app spyware prevention system, and it handles legitimate (if annoying) apps just fine.

—Mary Landesman

## New Wi-Fi Finders Work Well

### WIRELESS NETWORKING

WI-FI SIGNAL DETECTORS should let you track down a wireless signal before booting up your notebook and wasting power. Unfortunately, early versions of the devices didn't work very well. I tested three new devices and found them dramatically more useful than previous products.

Kensington's \$30 **WiFi Finder Plus** is about the size of a Tic Tac mints box. To use it, simply press a button; if the device locates an 802.11b or g wireless signal, it indicates the strength by lighting from one

to five green LEDs. A single blue LED lights in the presence of a Bluetooth signal. The device seemed quite accurate, but with each click it latches on to a single signal, so expect to push the button repeatedly to find the strongest signal.

Smith Micro's \$30 **QuickLink Mobile Wi-Fi Seeker** is even littler than the Kensington unit and has a single button. Hold down the button, and while you walk around, the device will display the ever-changing signal strength of detected 802.11b and g networks in the area, via four red LEDs.



**NEW WI-FI FINDERS** from Canary Wireless, Kensington, and Smith Micro work better, and offer more information, than previous devices.

Canary's **Digital Hotspotter** sells for \$50. Bulkier than the other two devices but still easy to pocket, the Digital Hotspotter not only notes 802.11b and g signal strength but also re-

ports the name of the network (SSID), its broadcast channel, and whether the network is encrypted or open.

If you just want to know if a signal exists and how strong it is, either the Kensington or the Smith Micro device will do the trick; if you're interested in finding out more detailed information before you break out your notebook, pay extra for the Canary.

—Michael S. Lasky

#### Digital Hotspotter

Canary Wireless

★★★★★

Pricier unit offers everything from signal strength to SSID.

List: \$50

[find.pcworld.com/46396](http://find.pcworld.com/46396)

#### QuickLink Mobile Wi-Fi Seeker

Smith Micro

★★★★★

Detects ever-changing Wi-Fi signal strength with one touch.

List: \$30

[find.pcworld.com/46394](http://find.pcworld.com/46394)

#### WiFi Finder Plus

Kensington Technology

★★★★★

Reveals Wi-Fi signal strength or Bluetooth, but you'll click a lot.

List: \$30

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Intel® SE7520J2 (E7520 chipset) Server Board  
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Seagate® 73GB 10,000rpm Ultra320 SCSI Hard Drive  
Up to 6 x Hot-swap Ultra320 SCA 1" SCSI Drive Bays  
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# New Graphics Chips for Budgets Big and Small

## GRAPHICS CARDS

THE LATEST PCI Express graphics chips from NVidia and ATI are gunning for two distinctly different types of PC users: ATI's ultra-high-end **Radeon X850 XT Platinum Edition** chip will appeal to those willing to pay big money for top performance, while NVidia's **GeForce 6200** chips containing TurboCache technology will appeal to budget-system vendors and users with entry-level systems seeking to improve their graphics-rendering capabilities on the cheap.

We tested reference boards based on the new chips and found that though each serves a niche, most PC users would be better served choosing a graphics card with capabilities and pricing somewhere between these two extremes.

## LESS CASH FOR TURBOCACHE

NVIDIA'S NEWEST 6200 chips feature a technology called TurboCache that uses a memory manager to dynamically

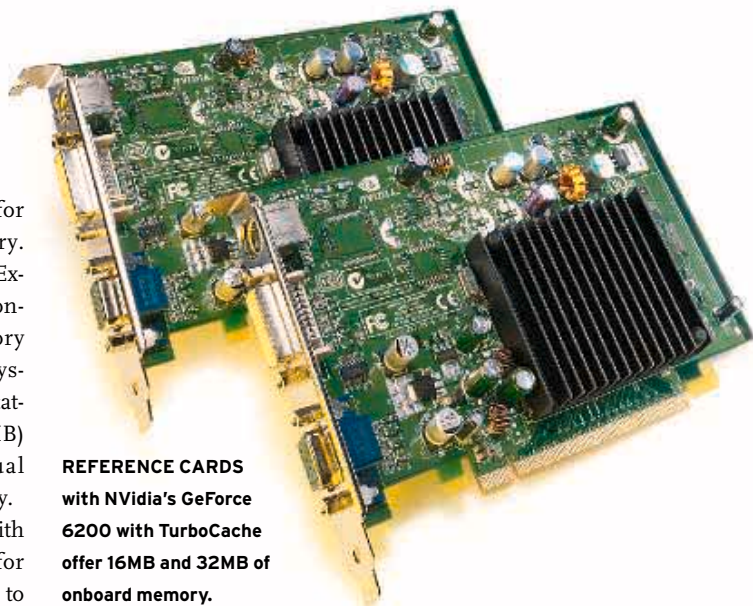
allocate system memory for graphics use as necessary. TurboCache exploits PCI Express's speedy two-way connection to system memory and melds the allocated system memory with the dedicated memory (16MB or 32MB) on the board for a virtual 128MB of graphics memory.

NVidia expects boards with 16MB of memory to sell for about \$79 and 32MB cards to sell for about \$99. That's less than comparable cards with 128MB of memory on board.

Our tests showed that 6200-based boards should offer a nice boost to PCI Express systems currently using integrated graphics. However, these boards aren't exactly graphics powerhouses. And although NVidia says the chips can handle current games at resolutions of up to 1024 by 768, our tests demonstrated that many of today's games were largely unplayable at that resolution.

How unplayable? In our 1024 by 768 benchmark tests with Far Cry, the 32MB board yielded 25 frames per second, while the 16MB test board

**REFERENCE CARDS with NVidia's GeForce 6200 with TurboCache offer 16MB and 32MB of onboard memory.**



squeaked out a measly 15 fps. The boards fared worse running Doom 3 at the same resolution: The 16MB board netted a meager 12 fps and the 32MB board just 19 fps.

For just \$20 more, the 6200 with 32MB of dedicated memory is the better option of the two NVidia-based cards we tested, and is clearly an improvement over today's integrated graphics. However, if graphics performance matters at all to you, we recommend skipping these low-end chips. Instead, pay an extra \$100 for a card with NVidia's excellent mainstream 6600 GT graphics chip.

## ATI'S NEW TOP CHIP

ATI'S RADEON X850 XT Platinum Edition is essentially the company's previous top chip, the Radeon X800 XT Platinum Edition, but with a few modifications and running at a slightly higher clock speed. Our PCI Express board, which came equipped with 256MB of memory, yielded modestly better performance than a previously tested \$400 X800 XT

(non-Platinum Edition) board that had the same amount of RAM. The new board sells for a whopping \$550.

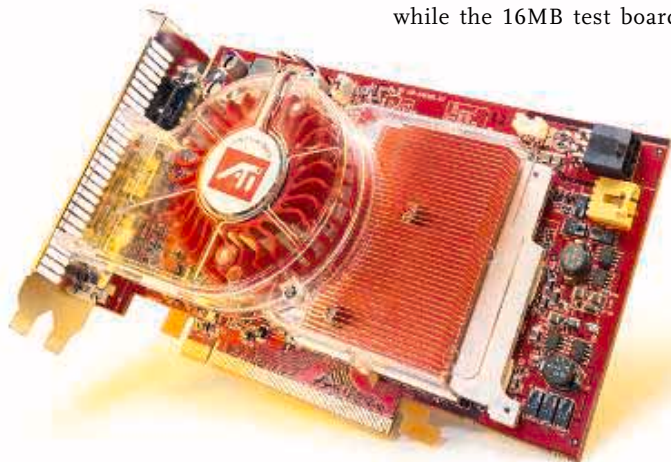
In our Doom 3 test at 1024 by 768 with antialiasing and anisotropic filtering turned on, the X850 cranked out 52 fps compared with the X800's 46 fps. At 1600 by 1200 the X850 managed 31 fps versus 26 fps for the X800.

Our Far Cry test produced comparable results. At 1024 by 768 the X850 and X800 performed neck and neck with antialiasing and anisotropic filtering turned on, scoring 66 and 61 fps respectively. At 1600 by 1200, they managed 17 and 15 fps.

In other words, while you're likely to enjoy slight performance gains if you switch from a board based on ATI's X800 XT to one using the X850 XT PE chip, it's a minor bump for some major cash.

If you must have the tops in graphics, then the X850 XT PE is for you. If you're willing to give up a few frames per second to save some cash, go with the X800 XT instead.

—Patrick Norton



ATI'S NEW RADEON X850 XT PE offers top-notch graphics at a price.



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## T-Bird E-Mail App a Winner

### E-MAIL SOFTWARE

IF YOU FIND yourself spending more time sorting your e-mail than reading it, consider the Mozilla Foundation's new **Thunderbird** e-mail client. The free program, which complements the group's Firefox browser, combines advanced e-mail sorting functions, first-rate spam filters, and lightning-fast performance to help cut through your inbox like a hot knife through butter.

#### Thunderbird 1.0

Mozilla Foundation

★★★★★

E-mail client is fast, functional, and free; but a few bugs still need to be worked out.

Street: Free to download

[find.pcworld.com/46322](http://find.pcworld.com/46322)

I tested version 1.0 of Thunderbird (a 5.8MB download). After years of using Microsoft Outlook, the switch was like trading in a big, lumbering Buick for a Mustang GT. A mere second after you launch the program, it's ready to retrieve your mail or compose a message. With Outlook, you launch the software and go grab a cup of coffee while it loads its numerous modules.

Like most people, I'm in too much of a hurry to create a nice, neat folder hierarchy for my received e-mail, so I tend to keep all my messages in the inbox. That's why my favorite Thunderbird feature—and the one that may get me to dump Outlook for good—is the ability to create custom views of



**THE NEW THUNDERBIRD** client makes it easy to set up custom views so you can easily find specific messages in a crowded inbox.

the inbox based on easy-to-set rules. For example, I created a "Family view" that shows only messages from people in my personal address book named "O'Reilly" (I could also add other names or conditions).

Of course, any e-mail program worth its salt today has to be able to handle spam, too. Thunderbird's Junk Mail Controls include adaptive filters that are trained to identify spam based on the contents of

your incoming messages. The program also helps keep your system free of viruses.

The program does occasionally betray its 1.0 nature. For example, I encountered bugs when entering information into my Personal Address Book, and I noticed that the app's Help link was broken.

That said, the free program proved to be a fast, simple, and full-featured e-mail client.

—Dennis O'Reilly

## Recycle Your Hard Drive

### STORAGE

MY INNER RECYCLER loves finding new ways to use old tech products, so Wiebetech's **TrayDock** hot-swappable hard-drive enclosure intrigued me.

The product lets you convert any internal IDE or SATA hard drive into an external unit perfect for backups. In my tests the product worked well, although for \$170 (sans drive) it isn't the best option for people seeking a basic,

inexpensive backup solution.

The aptly named TrayDock is a solidly built, black metal box with a removable tray. The basic bundle comes with either an empty IDE tray or an empty SATA tray (additional trays sell for \$50 apiece). Wiebetech also sells the box with a SATA or IDE hard drive (prices start at \$250 for a 120GB unit). Because I always seem to have a few hard drives lying around, I opted for a unit with an empty IDE tray.

You connect your drive to the short IDE (or SATA) and power cables built into the tray. You then slide the tray into the TrayDock, plug in the unit's AC adapter, connect the TrayDock to your PC via USB 2.0 or FireWire (cables includ-



**WIEBETECH'S TRAYDOCK** lets you swap out SATA or IDE hard drives.

ed), and then power it up.

Using USB 2.0 as my connection, my Windows XP system immediately recognized the TrayDock as a USB drive. When I swapped in a second drive, though, I had to turn the box off and on again for Windows to see it. Transfer speeds were acceptable, but I wouldn't advise using the

TrayDock drive for demanding tasks like video editing.

If you're simply looking for an affordable external hard drive, you can find a better deal. However, it's an excellent product for anyone who has old drives or who needs to swap in different drives for backup and security purposes.

—Ramon G. McLeod

#### TrayDock

Wiebetech

★★★★★

Easy-to-use device lets you reuse old hard drives and swap in multiple drives for backups.

Street: \$170, extra trays \$50

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## Gateway's Photo Jukebox Disappoints

### AUDIO PLAYER

GATEWAY'S **MP3 Photo Jukebox** is an interesting combination of good ideas poorly implemented. The \$250 player has some intriguing features—including the ability to store and display digital photos—but in the end its weaknesses far outweigh its strengths.

One of those weaknesses is the display. The Jukebox is the first mini hard-drive MP3 player to feature a color LCD. Unfortunately, at a mere 1.6

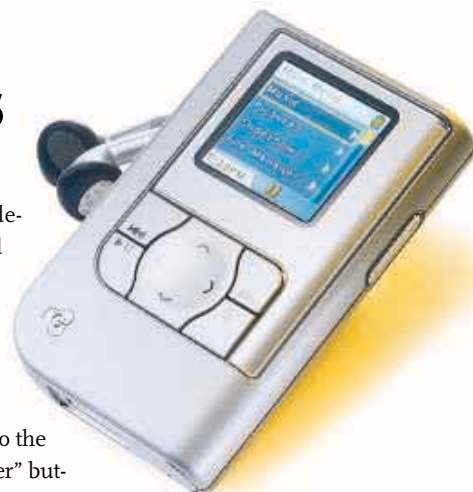
inches measured diagonally, the square screen feels much too cramped for viewing photographs satisfactorily.

The Gateway has other size issues, too. While it offers a light weight (3.4 ounces) and capacity (4GB) similar to those of other small-fry competitors such as the Creative Zen Micro, iPod Mini, and Rio Carbon, it's noticeably bulkier than those players and feels a bit hollow in your hand.

And then there's the battery. Gateway wisely outfits the Jukebox with a rechargeable, user-replaceable lithium ion battery (a second battery sells for \$30). Unfortunately, in my informal tests the player ran for a less-than-stellar 8 hours between charges.

The Jukebox's laundry list of near-miss design decisions would be easier to live with if the unit were more fun to use. Regrettably, the interface is strangely unintuitive (due in part, perhaps, to the lack of any sort of "enter" button), and the menus have an unpolished feel to them.

Sound quality is decent, but Gateway doesn't throw in any extras like an FM receiver or a voice recorder. Moving files (music or photos) onto the unit is a straightforward affair, but even charging the unit is a pain; you must connect the AC adapter cable to the USB cable before you can plug the entire contraption in.



**GATEWAY'S MP3 PHOTO Jukebox offers a color screen, but has an unpolished interface.**

A mini hard-drive MP3 player with a color screen and a removable battery sounds pretty promising on paper. Unfortunately, the reality of the Gateway MP3 Photo Jukebox is far less compelling.

—Tom Mainelli

### MP3 Photo Jukebox

Gateway

★★★★★

Tempting feature list proves less appealing with the unit in hand.

Street: \$250

[find.pcworld.com/46328](http://find.pcworld.com/46328)

## Online Storage for a Penny a Megabyte

### BACKUP

PROTECTING the data on your PC demands a two-pronged backup strategy: regular local backups plus off-site storage of a second backup copy. Affordable external hard drives have made local backups a breeze; off-site backups,

though, can still be tricky and expensive. Acpana Business Systems' new **Data Deposit Box** service offers an easy, Web-based solution with a simple interface and pricing plan.

The problem with most Web-based backup service plans is that they typically lack

flexibility, offering you large chunks of storage space and charging the full rate whether you use all of the space or not. Acpana takes a different approach, charging you a penny per megabyte each month for the storage you use.

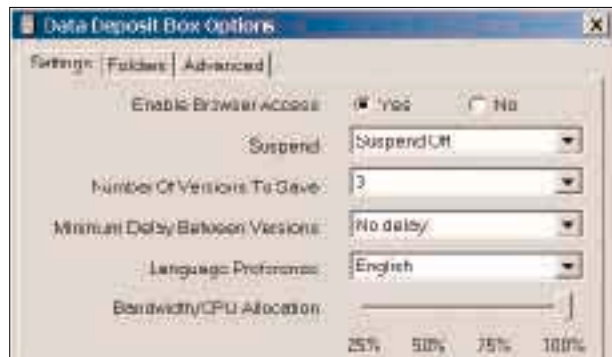
For example, backing up 900MB of data will cost approximately \$9 a month. That same data, stored using one of two major competitors—Connected Data Protector and NovaStor Online Backup Services—would cost around \$15 per month (for up to 2GB) and \$38 per month (for up to 1GB), respectively.

Obviously, Acpana's prorated plan doesn't always work out to be the best deal (if you have close to 2GB to back

up, Connected's price is better than Data Deposit Box's). But for people who have smaller amounts of critical data—500MB or less—the Data Deposit Box model is the most affordable choice.

I found the Data Deposit Box interface easy to use, and restoring backed-up data was simple. Plus, it provides easy access to your files from any browser, and offers password-protected access you can share with family or coworkers.

—Rex Farrance



**THE DATA DEPOSIT BOX service offers an easy-to-use interface that lets you select options such as how many versions of a file to save.**

### Data Deposit Box

Acpana Business Systems

★★★★★

Easy, inexpensive way to make sure your backup data is always safe, current, off-site, and easily accessible from anywhere.

List: \$0.01 per MB per month

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THE LG FLATRON IS FLAT-OUT THIN.



WALL MOUNTED (front view)



SLIM SCREEN



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90° TILT (auto image flip)



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L1980U model shown

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(model not featured)

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IBM Think Express models are configured and priced with small to medium-size businesses in mind.

IBM rated #1 in tech support for desktops and notebooks by PC Magazine readers. PC Magazine 17th Annual Reader Satisfaction Survey – July 14, 2004

**\*Availability:** All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. **\*Pricing:** does not include tax or shipping and is subject to change without notice. Reseller prices may vary. Starting price may not include a hard drive, operating system or other features. Price may include applicable discounts. **Warranty:** For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept. JDJA/B203. IBM makes no representation or warranty regarding third-party products or services. **Footnotes: (1) Embedded Security Subsystem:** requires software download. **(2) Mobile Processor:** Power management reduces processor speed when in battery mode. **(3) Wireless 11a, 11b and 11g:** based on IEEE 802.11a, 802.11b and 802.11g, respectively. An adapter with 11a/b, 11b/g or 11a/b/g can communicate on either or any of these listed formats respectively; the actual connection will be based on the access point to which it connects. **(4) Included software:** may differ from its retail version (if available) and may not include user manuals or all program functionality. License agreements may apply. **(5) Memory:** For PCs without a separate video card, memory supports both system and video. Accessible system memory is up to 64MB less than the amount stated, depending on video mode. **(6) Hard drive:** GB = billion bytes. Accessible capacity is less; up to 4GB is service partition. **(8) Limited warranty:** Support unrelated to a warranty issue may be subject to additional charges. **(9) ServicePac services:** are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. Service levels are response-time objectives and are not guarantees. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all

*TEAM LinG - Live, Informative, Non-cost and Genuine!*



## Put a solid barrier between your wireless PC and thieves.

Select IBM wireless ThinkPad® notebooks, like the ThinkPad X40 featured to the right, offer an added layer of data protection — a vaultlike combination of a built-in security chip and sophisticated data encryption software.<sup>1</sup> In fact, it's so advanced, it actually makes data unreadable if tampered with.

And only IBM offers PCs with this level of security as a standard feature.

Plus, with Intel® Centrino™ Mobile Technology and on-the-fly folder encryption, users can work wherever they please, knowing that their data will be protected. No matter who's lurking around. **Instead**

**of a welcome mat.**

Embedded Security Subsystem. [Only on a ThinkPad.](#)

Contact your IBM Business Partner or go to **ibm.com/shop/m546** to locate the nearest reseller.



### MOBILE TECHNOLOGY

#### IBM ThinkPad G41 Ultimate Value

##### Distinctive IBM Innovations:

- IBM Rescue and Recovery™ – One-button recovery and restore solution
- Access IBM – IBM help at your fingertips

##### System Features:

- Mobile Intel® Pentium® 4 Processor 532 (3.06GHz)<sup>2</sup> with HT Technology
- Microsoft Windows XP Home Edition<sup>4</sup>
- 14.1" XGA TFT display (1024x768)
- 128MB DDR SDRAM<sup>5</sup>
- 30GB hard drive<sup>6</sup>
- CD-ROM
- ComfortSlant keyboard
- EasyPivot base
- 1-yr system/battery limited warranty<sup>8</sup>

NavCode 288157U-M546

MODEL PRICED AT: **\$999\***

\$36/mo for 36 months  
SuccessLease for Small Business<sup>19</sup>  
ServicePac® Service Upgrade:<sup>9</sup>  
3-yr Depot Repair #30L9192 **\$132**

#### IBM ThinkPad X40 Our thinnest and lightest

##### Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0
- IBM Rescue and Recovery™ – One-button recovery and restore solution

##### System Features:

- Intel® Centrino™ Mobile Technology
  - Intel® Pentium® M Processor ULV 713 (1.10GHz)
  - Intel® PRO/Wireless Network Connection 802.11b/g<sup>3</sup>
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- 256MB DDR SDRAM
- 20GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard<sup>10</sup>
- Only .94" thin<sup>11</sup>
- 2.7-lb travel weight<sup>12</sup>
- 1-yr system/battery limited warranty<sup>8</sup>

NavCode 2386A4U-M546

THINK EXPRESS MODEL PRICED AT: **\$1,499\***

\$54/mo for 36 months  
SuccessLease for Small Business

locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. Calls must be received by 5pm local time in order to qualify for Next Business Day service. **(10) Full-size keyboard:** As defined by ISO/IEC 15412. **(11) Thinness:** may vary at certain points on the system. **(12) Travel weight:** includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. **(19) SuccessLease:** SuccessLease program, rates and terms are provided by third-party financiers approved by IBM Global Financing to credit-qualified business customers installing in the U.S. Featured monthly lease payments based on prespecified end-of-lease purchase option; documentation fee and first month's payment due at lease signing; taxes are additional. Options cannot be leased separately. IBM and IBM Global Financing reserve the right to alter product offerings, specifications or financing terms at any time, without notice. **Trademarks:** The following are trademarks or registered trademarks of IBM Corporation: IBM, the IBM logo, Rapid Restore, Rescue and Recovery, ThinkPad, Ultrabay, UltraConnect and UltraNav. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, Intel Xeon, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Intel SpeedStep and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other company, product and service names may be trademarks or service marks of other companies. © 2004 IBM Corporation. All rights reserved. Visit [www.ibm.com/pc/safecomputing](http://www.ibm.com/pc/safecomputing) periodically for the latest information on safe and effective computing.

**TEAM LinG - Live, Informative, Non-cost and Genuine!**

Take a look at some of our latest models. And get state-of-the-art security.



### Why IBM ThinkPad Notebooks?

To make IBM ThinkPad® notebooks even more valuable, each one featured here can give you the efficiency, productivity and edge you need and comes with all the following ThinkVantage™ Technologies:

#### IBM Active Protection System:

Butterfingers unite! Select IBM ThinkPad notebooks now include airbag-like technology to help protect your hard drive from some damage caused by drops and jolts.

#### IBM Rescue and Recovery:

Lost your data because of a software crash or virus? Recover previously saved data in minutes with our one-button solution.

#### IBM Access Connections:

Switch between wired and wireless connections.

#### IBM Embedded Security Subsystem 2.0:<sup>1</sup>

Hackers and thieves, beware. Our combined hardware and software solution is designed to protect user data and keep it private.

#### Access IBM:

Get the help you need, when you need it. One button on your ThinkPad notebook brings you a world of resources and assistance.

### IBM ThinkPad R51

#### System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 725 (1.60GHz)<sup>2</sup>
- Intel® PRO/Wireless Network Connection 802.11b/g<sup>3</sup>
- Microsoft Windows XP Professional<sup>4</sup>
- 15" XGA TFT display (1024x768)
- 256MB DDR SDRAM<sup>5</sup>
- 30GB hard drive<sup>6</sup>
- Integrated Ethernet and modem
- IBM Ultrabay™ Enhanced CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength
- 1-yr system/battery limited warranty<sup>8</sup>

NavCode 2883GKU-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$1,299\***

\$47/mo for 36 months  
SuccessLease for Small Business<sup>10</sup>



### IBM ThinkPad T42

#### System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 725 (1.60GHz)
- Intel® PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 14.1" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM
- 30GB hard drive
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim DVD-ROM
- IBM UltraConnect Antenna for increased signal strength
- 1-yr system/battery limited warranty<sup>8</sup>

NavCode 2378R3U-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$1,499**

\$54/mo for 36 months  
SuccessLease for Small Business  
ServicePac Service Upgrade<sup>12</sup>:  
3-yr Depot Repair #30L9192 **\$132**

### IBM ThinkPad T42

#### IBM ThinkVantage Technologies:

- Integrated Fingerprint Reader - Your passwords at the tip of your finger.

#### System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 745 (1.80GHz)
- Intel® PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 512MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- 3-yr system/1-yr battery limited warranty<sup>8</sup>

NavCode 2379R8U-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$1,999**

\$72/mo for 36 months  
SuccessLease for Small Business  
ServicePac Service Upgrade:  
4-yr Onsite Repair/9x5/Next Business Day  
Response #69P9198 **\$299**



### IBM ThinkPad X40

#### IBM ThinkVantage Technologies:

- Longest standard battery life of any leading-brand Ultra portable<sup>21</sup>

#### System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor ULV 738 (1.40GHz)
- Intel® PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- Intel Extreme Graphics 2
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM fullsize keyboard<sup>14</sup>
- Up to 7.0-hr Li-Ion battery<sup>15</sup>
- 1-yr system/battery limited warranty<sup>8</sup>

NavCode 2386E9U-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$1,749**

\$63/mo for 36 months  
SuccessLease for Small Business  
ServicePac Service Upgrade:  
3-yr Onsite Repair/9x5/Next Business Day  
Response #30L9195 **\$243**

### IBM ThinkPad X40 Solution Pack

#### IBM ThinkVantage Technologies:

- Longest standard battery life of any leading-brand Ultra portable<sup>21</sup>

#### System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor ULV 738 (1.40GHz)
- Intel® PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Up to 7.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty<sup>8</sup>

#### Accessories Included:

- ThinkPad X4 UltraBase Dock
- IBM Ultrabay Slim CD-RW/DVD-ROM combo

NavCode 2382ECU-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$2,249**

\$81/mo for 36 months  
SuccessLease for Small Business  
ServicePac Service Upgrade:  
5-yr Onsite Repair/9x5/Next Business Day  
Response #69P9200 **\$449**



(Monitor not included)

### Why IBM ThinkCentre PCs?

Only IBM offers these features to protect your users, connect them, and keep them working. Each ThinkCentre™ desktop featured here can give them the efficiency, productivity and edge they need with the following ThinkVantage Technologies:

#### Rescue and Recovery:

Lost your data because of a software crash or virus? Recover previously saved data in minutes with our one-button solution.

#### Access IBM:

Get the help you need, when you need it. One button on your ThinkCentre desktop brings you a world of IBM resources and assistance.

### IBM ThinkCentre A50 Tower form factor

#### IBM ThinkVantage Design:

- Toolless cover and hard drive removal

#### System Features:

- Intel® Pentium® 4 Processor with HT Technology 3GHz
- Microsoft Windows XP Professional
- Intel® Extreme Graphics 2
- 256MB DDR PC3200<sup>5</sup>
- 40GB hard drive • CD-ROM
- 6 USB 2.0 Ports (2 on front)
- IBM Preferred Pro Keyboard
- IBM USB Optical Wheel Mouse
- Integrated SoundMAX Cadenza audio solution
- Integrated 10/100 Ethernet
- Norton AntiVirus™ with 90 days of virus definition updates
- Lotus® SmartSuite® Millennium license
- 1-yr parts limited warranty with 1-yr limited onsite service<sup>17</sup>

NavCode 814821U-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$639**

\$23/mo for 36 months  
SuccessLease for Small Business

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**\*Availability:** All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. **\*Pricing:** does not include tax or shipping and is subject to change without notice. Reseller prices may vary. Starting price may not include a hard drive, operating system or other features. Price may include applicable discounts. **Warranty:** For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept JDJA/B203. IBM makes no representation or warranty regarding third-party products or services. **Footnotes:** (1) **Embedded Security Subsystem:** requires software download. (2) **Mobile Processors:** Power management reduces processor speed when in battery mode. (3) **Wireless 11a, 11b and 11g:** based on IEEE 802.11a, 802.11b and 802.11g, respectively. An adapter with 11a/b, 11b/g or 11a/b/g can communicate on either or any of these listed formats respectively; the actual connection will be based on the access point to which it connects. (4) **Included software:** may differ from its retail version (if available) and may not include user manuals or all program functionality. License agreements may apply. (5) **Memory:** For PCs without a separate video card, memory supports both system and video. Accessible system memory is up to 64MB less than the amount stated, depending on video mode. (6) **Hard drive:** GB = billion bytes. Accessible capacity is less; up to 4GB is service partition. (8) **Limited warranty:** Support unrelated to a warranty issue may be subject to additional charges. (12) **ServicePac services:** are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. Service levels are response-time objectives and are not guarantees. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may

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# IBM recommends Microsoft® Windows® XP Professional.



(Monitor not included)

## IBM ThinkCentre A50 Ultra small form factor

### System Features:

- Intel® Pentium® 4 Processor with HT Technology 3GHz
- Microsoft Windows XP Professional
- Intel® Extreme Graphics 2
- Ultra small form factor — 74% smaller than a standard IBM desktop<sup>16</sup>
- 256MB DDR PC3200
- 40GB hard drive • CD-ROM
- Gigabit-Ethernet Integrated
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- 1-yr limited warranty with 1-yr limited onsite service<sup>17</sup>

NavCode 809021U-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$759**

\$27/mo for 36 months  
SuccessLease for Small Business

ServicePac Service Upgrade:  
3-yr Onsite/9x5/Next Business Day  
Response #54P1861 **\$132**

## IBM ThinkCentre A51p Tower form factor (model not shown)

### System Features:

- Intel® Pentium® 4 Processor 530 with HT Technology
  - Processor speed 3GHz
  - 800MHz FSB
- Microsoft Windows XP Professional
- Intel® Graphics Media Accelerator 9000
- 256MB DDR2 PC2-3200
- 40GB hard drive • CD-RW
- Gigabit Ethernet-integrated
- IBM Embedded Security Subsystem 2.0
- 1-yr limited warranty with 1-yr limited onsite service<sup>17</sup>

NavCode 842721U-M546

THINK EXPRESS MODEL  
PRICED AT:

**\$799**

\$29/mo for 36 months  
SuccessLease for Small Business

ServicePac Service Upgrade:  
3-yr Onsite/9x5/4-hr Response  
#54P1862 **\$239**



## IBM eServer xSeries® 226

### System Features:

- IBM ServeRAID™-7e features integrated RAID-0 or -1 standard
- IBM Director and optional Remote Supervisor Adapter II for proactive remote management for distributed environments
- Intel® Xeon™ Processor 2.80GHz
- 1GB/16GB Std/Max
- Integrated Dual Channel U320 SCSI
- Two 36.40GB Hot Swap SCSI HDDs
- Gigabit Ethernet
- 1-yr limited warranty with 1-yr limited onsite service<sup>17</sup>

NavCode 86480EU-M546

PRICED AT:

**\$1,919**

ServicePac Service Upgrade:  
3-yr Onsite/9x5/Next Business Day  
#96P2248 **\$229**

## IBM eServer xSeries® 236

### System Features:

- Externally visible Light Path diagnostic panel
  - Displays information about a component without interrupting system operation
  - Visible without removal of system covers
- Integrated System Management Processor
  - Continuously monitors your system, notifying you of potential system failures or changes
- Intel® Xeon™ Processor 2.80GHz
- 1GB/16GB Std/Max
- Integrated Dual Channel U320 SCSI
- Three 73.4GB Hot Swap SCSI HDDs
- ServeRAID™ 7k SCSI adapter
- Gigabit Ethernet
- 3-yr limited warranty with 1-yr onsite service<sup>17</sup>

NavCode 88410EU-M546

PRICED AT:

**\$3,879**

ServicePac Service Upgrade:  
3-yr Onsite/24x7x4 hour  
#21P2084 **\$689**



## IBM eServer BladeCenter

### System Features:

- Flexible - full performance and manageability of traditional rack optimized platforms
- Infrastructure integration - help lower TCO and increase control
- Simplify - easy to deploy, easy to install, easy to manage

### HS20

- Intel® Xeon™ 2.80GHz/533Mhz FSB
- 40GB IDE/2GB DDR2 PC2100
- 3-year limited warranty<sup>8</sup>

NavCode 8832LEX-M546

EXPRESS MODEL PRICED AT:

**\$2,589**

### BladeCenter Chassis

- 7U rack mount chassis—up to 14 blades per chassis
- 2000W power
- Cisco Ethernet switch module

NavCode 86773EU-M546

EXPRESS MODEL PRICED AT:

**\$7,289**

\$243/mo for 36 months  
SuccessLease for Small Business

ServicePac Service Upgrade:  
3-yr Onsite/9x5/4-hr Response  
HS20 #69P9517 **\$279**  
BladeCenter Chassis #41L2736 **\$600**

## IBM eServer xSeries 336

### System Features:

- Leading performance with Intel® Extended Memory 64 Technology - 32 and 64bit simultaneous computing
- High Availability with redundant power and hot swap fans - Calibrated Vectored Cooling enables density and performance
- Simple Management with on board service processors and optional remote management support - take control of your server environment
- Intel Xeon 2.80GHz/800Mhz FSB
- Two 73GB SCSI/2GB DDR2 PC3200

NavCode 88370EU-M546

EXPRESS MODEL  
PRICED AT:

**\$3,349**

\$112/mo for 36 months  
SuccessLease for Small Business

ServicePac Service Upgrade:  
4-yr Onsite/9x5/4-hr Response  
#69P9243 **\$609**



## MOBILE TECHNOLOGY

### IBM Think Express Program:

We've configured and priced many of our products specifically for small and medium businesses. And best of all, they're available direct from IBM or through select IBM Business Partners.

### IBM ThinkPad Accessories

Belkin Components Universal Notebook Travel Surge Protector  
#22P7127 **\$20**

Kensington MicroSaver Security Cable Lock from IBM  
#73P2582 **\$39**

IBM ThinkPad Carrying Case<sup>18</sup> - Expander  
#73P3597 **\$59**

ThinkPad 72W AC/DC Combo Adapter  
#22P9010 **\$99**

ThinkPad Port Replicator II  
#74P6733 **\$179**

### IBM ThinkCentre Accessories

IBM UPS 500  
#33L3477 **\$99**

IBM ThinkVision™ L170p 17" Flat Panel Monitor with system purchase  
#W9SPH80 **\$449**

### IBM Server Accessories

IBM S2 42U Standard Rack Cabinet  
#93074SX **\$1,489**

IBM Rackmount XHV 10K UPS  
#21308RX **\$5,399**



Contact your IBM Business Partner or go to **ibm.com/shop/m546** to locate the nearest reseller.

choose to perform service at the depot repair center. Calls must be received by 5pm local time in order to qualify for Next Business Day Service. **(14) Full-size keyboard:** As defined by ISO/IEC 15412. **(15) Battery:** These model numbers achieved the Ziff Davis Media, Inc.'s Business Winstone® 2002 BatteryMark™ Version 1.0 Battery Run-down Time of at least the time shown. This test was performed without independent verification by the VeriTest testing division of Lionbridge Technologies, Inc. ("VeriTest") or Ziff Davis Media, Inc., nor VeriTest makes any representations or warranties as to these test results. Winstone is a registered trademark and BatteryMark is a trademark of Ziff Davis Publishing Holdings, Inc., in the U.S. and other countries. A description of the environment under which the test was performed is available at [ibm.com/pw/vw/thinkpad/batterylife](http://ibm.com/pw/vw/thinkpad/batterylife). Battery life (and recharge times) will vary based on many factors including screen brightness, applications, features, power management, battery conditioning and other customer preferences. **(16) Size claims:** are based on a comparison of chassis volume to the volume of IBM's standard desktop chassis. **(17) Systems with limited onsite service:** are designed to be repaired during the applicable warranty period primarily with customer-replaceable parts provided by IBM. IBM will only send a technician onsite to perform a repair if (a) remote telephone diagnosis and/or customer part replacement are unable to resolve the problem, or (b) the part is one of the few designated by IBM for onsite replacement. For a list of onsite replaceable parts, contact IBM. Support unrelated to a warranty issue may be subject to additional charges. **(18) Certain IBM logo products:** are not manufactured, warranted or supported by IBM; IBM logos and trademarks used under license. Contact IBM for details. **(19) SuccessLease:** SuccessLease program, rates and terms are provided by third-party financiers approved by IBM Global Financing to credit-qualified business customers installing in the U.S. Featured monthly lease payments based on prespecified end-of-lease purchase option; documentation fee and first month's payment due at lease signing; taxes are additional. Options cannot be leased separately. IBM and IBM Global Financing reserve the right to alter product offerings, specifications or financing terms at any time, without notice. **(20) Print speed:** Exact speed varies depending on document complexity, system configuration, software application, driver and printer state. **(21) Battery Life:** Based on manufacturer's published figures or CNET.com results for the top 5 vendors in first quarter 2004 notebook sales as reported by IDC. **Trademarks:** The following are trademarks or registered trademarks of IBM Corporation: IBM, the IBM logo, ImageUltra, Lotus, NavCode, Rapid Restore, Rescue and Recovery, SmartSuite, ThinkCentre, ThinkPad, ThinkVantage, InfoPrint, ThinkVision, UltraConnect, UltraBase, Ultrabay and UltraNav. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, Intel Xeon, Intel Inside logo, Intel Centrino, Intel Centrino logo, Intel SpeedStep and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other company, product and service names may be trademarks or service marks of other companies. © 2004 IBM Corporation. All rights reserved. Visit [www.ibm.com/pc/safecomputing](http://www.ibm.com/pc/safecomputing) periodically for the latest information on safe and effective computing.

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# Windows Rejuvenated!

Is your aging Windows machine slowing down? **Getting creaky?** Just plain showing its age? **Here's how to make it work the way it did fresh out of the box.**

BY LINCOLN SPECTOR • ILLUSTRATIONS BY DAN PAGE

**WINDOWS SLUDGE:** It's the invisible, undetectable detritus that collects on your hard drive and just mucks up the works. In the past, the clean install of a Windows upgrade could solve in one fell swoop all the little glitches that accumulate over time. But Longhorn's still a ways off, and service packs only go so far. I'll show you how to get Windows 98, Me, 2000, and XP back to their quick and reliable selves. And I'll describe how to toss an unfixable Windows setup and reinstall it from scratch. ►





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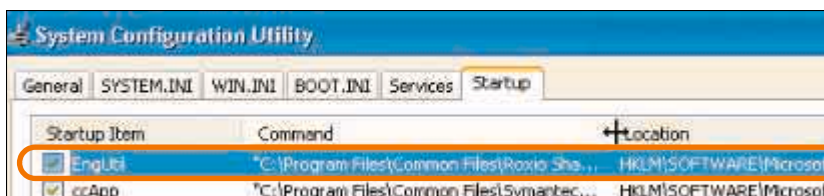
## A Windows Treatment

IF WINDOWS STUMBLES but doesn't fall, your PC likely needs only refurbishing, not a full operating system makeover. In fact, machines with startup problems can usually be repaired without a last-gasp reinstallation. (Of course, if your PC experiences problems before Windows loads, chances are they have nothing to do with the OS; go to [find.pcworld.com/46326](http://find.pcworld.com/46326) to read Kirk Steers' "Five-Minute Fixes" from January.) Follow these steps to rein-vigorate your current Windows setup.

### CUT BACK ON AUTOLOADS

YOU MAY BE amazed at just how many programs load automatically at Windows boot-up and then run in the background as you work (not all of them appear as icons in the system tray, either). Each of these programs uses memory and other resources, which might even cause a conflict with another program.

To view your list of autostart apps, select *Start*•*Run*, type **msconfig**, and press



**FIGURE 1:** What are those strange autoloading programs? Find out with the System Configuration Utility. (You may need to widen the Command column to view the entire path.)

**<Enter>** to open the System Configuration Utility. (Windows 2000 lacks this utility, so visit [find.pcworld.com/46260](http://find.pcworld.com/46260) to download Mike Lin's free Startup Control Panel alternative for that OS.) Click the *Startup* tab (see **FIGURE 1**). Uncheck items in this list to keep them from autoloading.

Windows 2000 needs no autoload programs, and Windows XP requires only one—sort of. If you don't use Microsoft Mes-

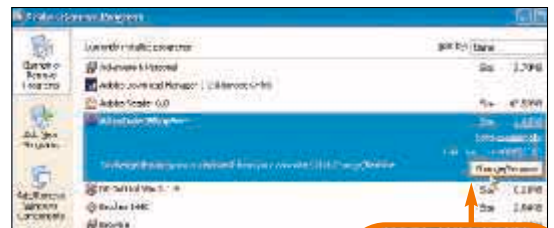
senger, you may want to uncheck 'msmsgs', but doing so can cause problems with Outlook, Internet Explorer, or other Microsoft programs. Windows 98 and Me have several autoloading applications. In these versions, keep LoadPowerProfile, SystemTray, ScanRegistry, PCHealth, and TaskMonitor selected (including both instances of the first one if it's listed twice, which can occur as part of Windows' boot process). If you use Windows' Task Scheduler, don't uncheck Scheduling Agent (to find out whether a program is using the applet, select *Start*•*Programs*•*Accessories*•*System Tools*•*Scheduled Tasks* and see if anything is listed). For Windows Me, keep StateMgr.

Determining whether you need your other autoload apps requires a bit of detective work. You can usually figure out what application put the entry in your startup list by reading the information in the Startup tab's Command column. For instance, if you see that the loading file is located in the Roxio folder, it's a good bet

that the entry is a Roxio program. Google can also help ferret out the source of these programs; if you search for the file name, you're bound to find an explanation.

Keep checked any listing related to your firewall or your antivirus program to make sure they're always running in the background. On the other hand, some autoloaders put an icon in the system tray for launching an application that you could just as easily launch from the Start menu. Having these programs autoload is a waste of resources, so uncheck away.

Sometimes it's a judgment call: If a utility enhances Windows in a way you like, running it at all times could be worthwhile. The four programs recommended in "Longhorn's Features—Now" (at right) fall into this "maybe for you" category. But even then, if Windows gives you trouble, consider disabling such a program—at



**FIGURE 2:** Uninstall programs you no longer use, but don't expect to remove every trace of them.

least temporarily—to see whether it's the culprit; life may be better without it.

Unfortunately some unchecked programs have a way of reappearing checked and autoloading, even though you just unchecked them. Why? The application that installed the autoloading program sees what you've done, and responds by "correcting" your mistake. (Older versions of Real Networks' media player are known offenders.) If this happens to you, unchecking the option will just create a cycle of frustration. Instead, launch the application and explore its menus, looking for a "load at startup" option. When you find it, uncheck it.

If you don't find such an option, check the vendor's Web site, or as a last resort call its technical support line. If you dis-



cover that there's no way to turn off the autoloader, and you have no good reason to leave it on, ask yourself how badly you want that program on your PC—which brings us to our next section.

### UNINSTALL UNUSED APPS

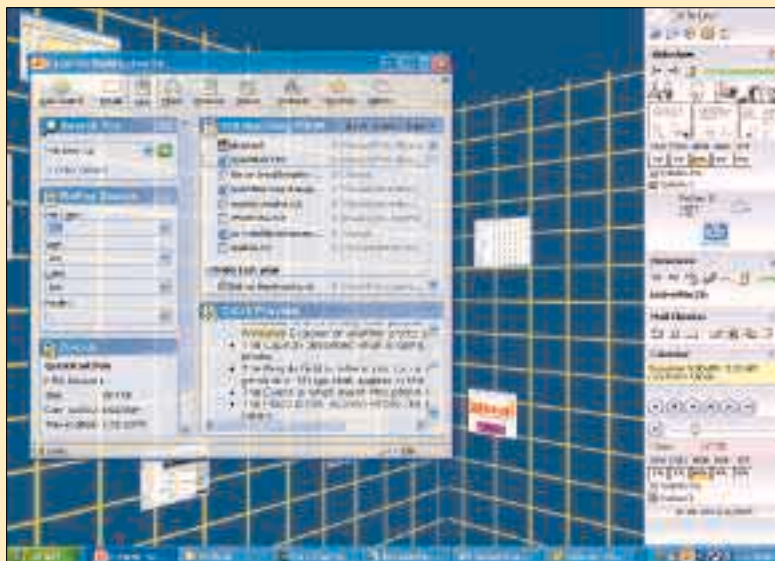
A PROGRAM DOESN'T have to be running to mess up Windows' performance. Getting rid of all the applications on your PC that you no longer use is a good idea. Doing so isn't always easy, however.

Most programs have their own uninstall routine. Unfortunately, these routines seldom remove everything. All too often installing a program gives you both benefits and problems, and uninstalling it removes only the benefits. I sometimes suspect that software developers write installation routines on the assumption that you bought your computer to run their software exclusively, and they create uninstall routines only because they have to—while reassuring themselves that no one would ever want to use the feature to remove their programming masterpiece.

Nevertheless, the program's own uninstall routine is the best place to start the removal process. You might find a shortcut to the uninstaller on the program's Start menu entry. If not, select *Start•Control Panel•Add or Remove Programs* (in Windows XP) or *Start•Settings•Control Panel•Add/Remove Programs* (in all other Windows versions). Find the program you want on the 'Currently installed programs' list (under the Install/Uninstall tab in Windows 98), click the *Add/Remove* or *Change/Remove* button (see **FIGURE 2**, previous page), and follow the prompts.

You haven't really gotten rid of the program yet. Reopen the System Configuration utility to see whether the uninstalled application still autoloads anything; if it does, follow the steps in "Cut Back on Autoloads" above. Next, open Windows Explorer and delete the program's folder inside the C:\Program Files directory (if it's still there). And if a shortcut to the program is still on the Start menu, right-click the item and then select *Delete*.

To reassigned any file associations ►



### NEW-LOOK WINDOWS

## Longhorn's Features—Now

EVERYONE'S waiting for Longhorn, Microsoft's follow-up to Windows XP due out in 2006 (last we checked). But you don't have to wait for some of the new operating system's most anticipated features. These four utilities give Windows XP several of Longhorn's projected interface improvements now, for a total cost of only \$40. Visit [find.pcworld.com/46288](http://find.pcworld.com/46288) for the downloads.

**Desktop Sidebar:** Longhorn will supplement the Windows taskbar with a new sidebar panel that displays information gleaned from your computer and the Internet. The free Desktop Sidebar utility from Idea2 already does that. The program's panels show your e-mail, Outlook calendar, system performance data, news feeds, and even a slide show. Like the Windows taskbar, the sidebar can display at all times or hide until you want it.

**Actual Transparent Window:** Ever wanted to see what's in the window behind the one that's currently active on your screen? In Longhorn you'll be able to make any window as transparent as you like. Actual Transparent Window, a \$20 shareware program from Actual Tools, does the same thing today. The program gives every window an extra title-bar icon to control transparency: Click it to have the window toggle between full opacity (the default) and 20 percent transparency. Set the transparency level on a window-by-window basis, or apply it to all windows at once using the program's configuration tool.

**Spaces:** My notes from testing Spatial Research's \$20 Spaces utility begin with a simple declaration: "This is really fun!" As Longhorn promises to do, Spaces replaces the flat Windows desktop with a three-dimensional workspace in which you can move running programs into the background or foreground, or to the side. Shift open windows around Spaces' two angled grids; zoom in and out, or rotate your desktop view. Spaces requires Microsoft's free .Net Framework, available at [windowsupdate.microsoft.com](http://windowsupdate.microsoft.com).

**Copernic Desktop Search:** Windows' search engine is pathetic. Longhorn promises to fix this via "libraries"—which have many of the attributes of folders—among other improvements. Copernic Technologies' free Copernic Desktop Search doesn't offer all that, but the program does search the contents of your files—so fast that you'll miss it if you blink. How does it do this? By indexing the files on your hard drive the way Web search engines index the Internet. And like a Web search engine, it allows you to do advanced searches using *and-or-not* strings; for instance, I can search for any files containing the words "Windows" and "Longhorn" plus the phrase "coming in 2006" but not the word "cow." Copernic Desktop Search even shows you the contents of the files that it finds.

GET THE LOOK of Longhorn now: Four utilities produce a partial facsimile of Longhorn today.

that the uninstalled program may have claimed, open Windows Explorer, select **Tools•Folder Options (View•Folder Options** in Windows 98), and click the **File Types** tab and then the **File Types** header under 'Registered file types' to sort the list of file types by program (this header isn't available in Windows 98). Check the list for any extensions associated with the uninstalled program. If you find one, click **Change** and select a new program to open that file type. For example, if you uninstall an image editor, you can reassociate .bmp files with Windows' own Paint utility. Or click **Delete** to make .bmp an unassociated file type. Then you'll be prompted for which program to use each time you attempt to open a file of this type.

You'll also want to clean the program out of the Windows Registry. (See "Pare the Registry" below for instructions.)

### FERRET OUT SPYWARE

YOU NEED to scan your system for spyware regularly, but it's especially important to do so when Windows behaves oddly (well, more oddly than usual).

No anti-spyware program I've used finds all the miscreants, so you should run more than one scanner. Fortunately, two of the best are free: Lavasoft's Ad-Aware and Patrick M. Kolla's Spybot Search & De-

spyware programs. And browse to [find.pcworld.com/46320](http://find.pcworld.com/46320) to read Steve Bass's tips on finding—and blocking—spyware.

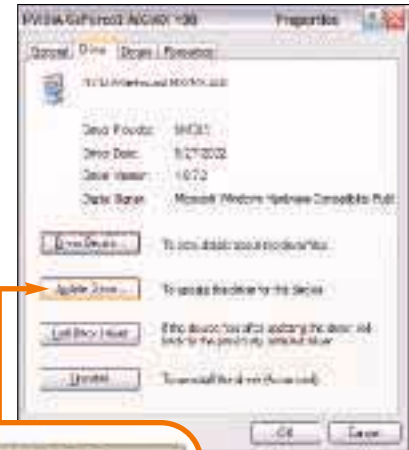
### UPDATE YOUR DRIVERS

CONVENTIONAL WISDOM urges us to frequently update our drivers—the programs that tell Windows what to do with hardware. Of course, conventional wisdom once held that the world is flat.

If your PC is running well, there's no reason to update your drivers. But if you're having trouble, a driver update might help. First, open Windows' Device Manager by right-clicking **My Computer** and selecting **Properties**. In Windows XP and 2000, click **Hardware•Device Manager**. In Windows 98 or Me, click **Device Manager**.

Look for entries with yellow question marks or red exclamation points: The question mark indicates that Windows is using a generic driver for that device instead of one designed for it, and an exclamation point means that the device is not working. The drivers for graphics boards, sound cards, and printers are most likely to need an update. Drivers under 'Computer', 'Disk drives', 'Floppy disk drives', and 'Keyboards' rarely require updating.

To update a driver, double-click the component listing and choose **Driver•**



**FIGURE 4:** Find an update for your old

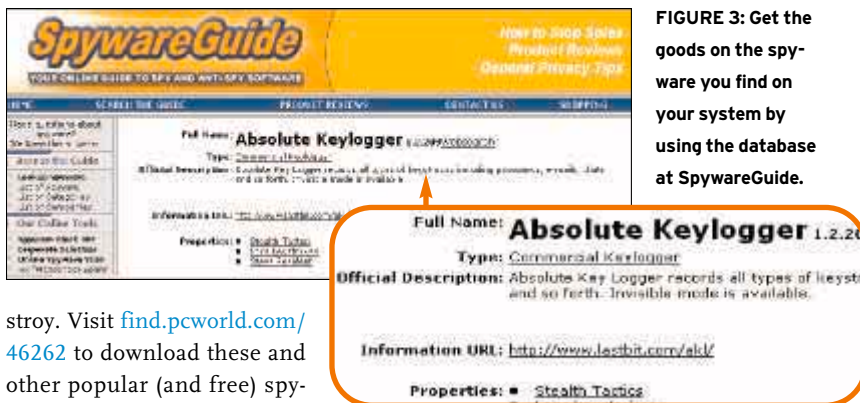
driver by clicking the **Update Driver** button in the Properties dialog box for the device.

Even if the wizard doesn't find one, a driver update may be available. Search for a new version on the vendor's Web site, or enter the full product name plus the word **driver** in a search engine. When you find an update, make sure it works with your version of Windows. Either the new driver will install automatically after you download and run it or it will provide you with installation instructions.

Updating a driver could make things worse, however. In Windows XP, click **Roll Back Driver** under the Driver tab in the Properties dialog box to return to the previous version. If you regret updating a driver in 98, Me, or 2000, your only option is to replace it with a generic driver (at least until the vendor releases a bug fix).

### PARE THE REGISTRY

THERE'S NO BIGGER rat's nest on a well-used Windows system than the Registry. Whenever you install software, change hardware, or download something from the Web, you pour gunk into this vast, loosely constructed database that Windows relies on to work properly. Cleaning it out can make a world of difference in Windows' performance. Before you start, make sure you can restore the Registry to its previous state should you delete the wrong key. Windows 98, Me, and XP (but not 2000) back up the Registry automatically, but it doesn't hurt to make an extra backup before doing something that could



**FIGURE 3:** Get the goods on the spyware you find on your system by using the database at SpywareGuide.

stroy. Visit [find.pcworld.com/46262](http://find.pcworld.com/46262) to download these and other popular (and free) spyware catchers. Get the latest updates for the programs after you install them and before you scan your system.

SpywareGuide ([www.spywareguide.com](http://www.spywareguide.com); see **FIGURE 3**), provides valuable information on malicious software from a database covering more than 800 known

**Update Driver** in the product's Properties dialog box (see **FIGURE 4**). The Hardware Update Wizard will search for an updated driver on your local drives as well as on Microsoft's Windows Update site, and it will install the driver if it finds one.



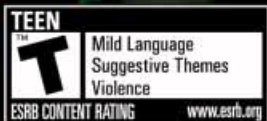


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hose your PC. With your personal data, it makes sense to store the backup at another location, but that's not the case with the Registry backup. If your hard drive goes bad, it's pointless to restore this Registry backup in another Windows setup.

In Windows XP and Me, you can use System Restore to back up the Registry. Select *Start•All Programs (Programs in Me)•Accessories•System Tools•System Restore•Create a restore point*, and then follow the prompts. To back up the Windows 98 Registry, select *Start•Run*, type **scanreg**, and press **<Enter>**. When you see no more errors, click *Yes* and then *OK*.

Windows 2000 offers no reliable way to back up your Registry, so you have to use third-party software. I recommend Lars Hederer's free Emergency Recovery Utility NT (ERUNT); browse to [find.pcworld.com/46268](http://find.pcworld.com/46268) for the download.

There are easier (and safer) Registry-cleaning tools than Windows' own Registry Editor. One is ChemTable Software's \$30 Reg Organizer ([find.pcworld.com/46270](http://find.pcworld.com/46270)), which gives you a conventional Registry editor (prettier than Microsoft's), as well as a tabbed view of Registry keys that often need cleaning (such as File Types and Startup Processes). You can even create a list of favorite Registry items and return to them with a single click (although a list of Registry keys that you must return to repeatedly would more appropriately be called "least favorite").

Reg Organizer's Registry Cleanup tool searches for problems and presents its findings. It can, at your discretion, repair some of the errors it finds and delete entries that it can't repair. And here's another cool Reg Organizer feature: If you've just uninstalled a program, click the utility's *Search and Replace* icon to finish the job. Here you can delete all listings containing the removed program's name (or the name of its vendor).

If you're brave enough to clean out the Registry with Windows' own Registry Editor, go to [find.pcworld.com/46272](http://find.pcworld.com/46272) to read "Care and Feeding of the Windows Registry," Stan Miastkowski's May 2002 *Step-By-Step* column, for instructions.



## Start Anew in Windows

SOMETIMES WINDOWS is beyond recovery, and there's nothing left but to put it out of your misery. And I don't suggest you do something dire, like buying a Mac.

A Windows reinstallation isn't always a last-resort solution, however. In fact, I reinstall my OS about once a year to clear out the cobwebs. But I'm a risk-taker by nature. The safest course is to wipe Windows clean only when you have to.

### BE PREPARED

IF ALL GOES WELL, you'll be done in only a couple of hours, but be ready to survive without the machine's services for a day or two if you need to troubleshoot the reinstall. Before you do anything, back up: Make a copy of all your data files and

place it on a CD or other removable medium. For optimal results, use a disk-imaging program such as Acronis's \$50 True Image (see **FIGURE 5**), which duplicates your hard drive so that it can be quickly and easily restored if necessary.

Next, collect your Windows installation CD (or

the restore CD that came with your computer), plus the discs for every application that you want to keep. If you don't have a restore CD, look for a restore utility on your PC, which likely has an option to create a restore CD. If you downloaded a shareware program and don't have a CD, make sure to track down the registration code needed to turn the free trial into the fully functional, unlimited-use version.

With luck, you won't need the CDs that came with your hardware, which are neither easy to access nor up-to-date. Put all of your current device drivers in a separate folder, away from C:\Windows, before the reinstall. I've written three batch files for doing this. Go to [find.pcworld.com/46290](http://find.pcworld.com/46290) to download the one for your version of Windows and to read the instructions for using it. But be forewarned: If a set-aside driver doesn't work, you may still need the outdated one from the vendor's CD.

Below are all the steps required to reinstall Windows XP and 2000. "New Beginnings for Windows 98 and Me" on page 68 has more info for those versions.

### GET SWEEPING

TAKE A DEEP BREATH, insert your Windows or restore CD, and reboot your PC. Restore CDs vary from vendor to vendor,

so I can't give you specific instructions. At their best, the discs are fully functional Windows CDs holding all the drivers you need. But at their worst, they only allow you to return your hard drive to its

factory condition—with Windows but without any of your data and programs.

If the only option on your restore ►



**FIGURE 5:** Before you reinstall Windows, create a complete image of your drive using a program such as True Image from Acronis.



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CD is a fresh factory installation, make doubly sure you have your data backed up before you reinstall. After the reinstall, you'll have to restore your data from this backup (but you can skip the "Match Users to Data" section below).

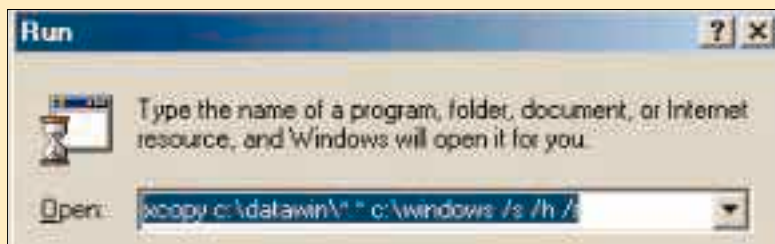
If your CD has a full copy of Windows XP or 2000, you'll be prompted to 'Press any key to boot from CD'. Do so. In the setup program, pick the options that will leave the previous file system in place while deleting (as opposed to repairing) the old operating-system files. For instance, if you're told 'To use the folder and delete the existing Windows installation in it, press L', press L. I got four of these prompts the last time I reinstalled Windows, since my system has multiple hard drives, each with multiple partitions.

You'll eventually be asked for your user name, as well as for the names of other users. Enter just one name—not your real name (problems can arise if Windows tries to make new folders with the same names as existing ones). Instead, enter the name **fake**, which you'll delete later.

### MATCH USERS TO DATA

WHEN YOU'RE BACK in Windows logged on as someone named "fake," open Windows Explorer to C:\Documents and Settings, select *Tools•Folder Options•View•Show hidden files and folders*, and make sure 'Hide protected operating system files (Recommended)' is unchecked. Click Yes, and then OK.

Now you'll see six or more folders, among which will likely be ones named All Users, All Users.WINDOWS, Default User, Default User.WINDOWS, and 'fake'. There will also be a folder for each of the old installation's log-in names. Open the Default User folder and look for one or more files named 'NTUSER' (they may have different file extensions). Delete these files, press **<Ctrl>+A** to select all the remaining files and folders, and then drag them all to the Default User.WINDOWS folder. At any dialog box, select Yes or, better yet, Yes to All (see **FIGURE 6** on page 70). When you're done, delete the empty Default User folder. Repeat the process ►



**USE THE COMMAND above to replace your personal data folders after you reinstall Windows 98 or Me. Open Add/Remove Programs (left) to create a startup floppy disk.**

## A CLEAN SLATE

# New Beginnings for Windows 98 and Me

REINSTALLING WINDOWS 98 and Me is trickier than reinstalling XP and 2000, but in many ways the process is the same: Follow all the steps in "Be Prepared" on page 66.

My driver-copy batch file for Windows 98 and Me also copies the data folders that reside inside C:\Windows to a backup folder named 'c:\datawin'. Because you must delete the old Windows folder before you install the new one, this data must be moved to a safe place. The folders that must be saved are All Users, Application Data, Desktop, Favorites, Local Settings, Profiles, SendTo, and Start Menu (not every installation has all of these folders). C:\My Documents doesn't need to be copied to a different location—it's already outside the Windows folders. If the PC has multiple users, everyone's individual My Documents folder is actually inside C:\Windows\Profiles, which my batch file will back up.

### START WITH A FLOPPY

YOU NEED A STARTUP FLOPPY to reinstall Windows 98 and Me. To create one, have a blank, formatted floppy disk ready and select *Start•Settings•Control Panel•Add/Remove Programs*. Click *Startup Disk•Create Disk*, and follow the prompts.

Next, reboot your system from that floppy. At the Startup Menu, select *Start computer with CD-ROM support*. Once DOS has loaded with a generic CD-ROM driver, put your Windows CD-ROM into the drive. At the DOS prompt, type **dir x:**, where x is your CD-ROM drive letter. This letter is probably one up from the CD drive letter that you're used to, so if Windows sees your CD drive as D:, it will probably be recognized as E: here. (Windows Me will show you the correct drive letter on screen.) Type **c:\windows\command\deltree /y c:\windows** (don't forget the spaces after "deltree" and "/y") and press **<Enter>**. Once you're back at the A> prompt, type **x:setup**, where x is again the CD drive letter, and press **<Enter>**. Follow the prompts. Don't forget to remove the floppy before Windows reboots.

(If your PC was set up for multiple users, select *Start•Settings•Control Panel•Users* (in 98) or *Start•Settings•Control Panel•view all Control Panel options•Users* (in Me). Use the exact log-in names that were used previously; each is now the name of a folder inside c:\datawin\profiles. Once you've re-created each user log-in, reboot and press **<Esc>** to bring you to Windows without logging you in as a specific user.)

Finally, select *Start•Run*, type **xcopy c:\datawin\\*.\* c:\windows /s /h /r**, and press **<Enter>**. If you're prompted about overwriting a file, press **a** for 'All'. When xcopy is finished, reboot your PC and follow the instructions in "Finish the Job" on page 70.



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FIGURE 6: Move old files and settings to new locations after reinstalling Windows XP or 2000.

with the All Users folder, copying everything except the 'NTUSER' files (if they exist) to the All Users.WINDOWS folder.

Return to the Documents and Settings folder and rename each of the folders for an actual user (rather than the All Users, Default User, and 'fake' folders) by adding the extension **.old** to the name. For instance, rename the folder 'Lincoln' to **Lincoln.old** (click the folder name once or use the **<F2>** key to rename folders).

To create the real accounts, select **Start•Control Panel•User Accounts** in Windows XP or **Start•Settings•Control Panel•Users and Passwords** in Windows 2000. Create an account for each user from the previous install. At least one of the accounts must have administrator privileges. In Windows 2000 you may have to check *Users must enter user name and password to use this computer* to create users.

Once all of the users are in place, log off "fake" and log on to each new account one at a time. In XP, select **Start•Log Off•Log Off**; in 2000, click **Start•Shut Down•Log off fake•OK**. If you are the only user, log on as yourself, log off, and log on again as "fake." If there are multiple users, first log on as one user, then log off and log on again as the next user, then log off again, and so on, until you've logged on and off as each user before logging back on as "fake." XP users: Resist the temptation to use the Switch User option (which does not exist in 2000); you need to completely log off each user, not just switch users.

Once you're logged back on as "fake," your Documents and Settings folder should have two folders for each real user: 'login name' and 'login name.old'. Delete the 'NTUSER' files and move the others

as described above for Default User, but this time from the 'login name.old' folder to the 'login name' folder. In other words, if the user's name is "Lincoln," you would enter the 'Lincoln.old' folder, delete all the 'NTUSER' files, and drag the remaining files and folders to the 'Lincoln' folder.

When you're done, log off "fake," and then log on to one of the system's real accounts with administrator privileges. Finally, return to Control Panel's User Accounts applet and delete the "fake" account, using the option to delete files.

### FINISH THE JOB

THE LAST STEP is to reinstall your drivers. If you ran my batch files before reinstalling, simply open Device Manager as described in "Update Your Drivers" on page 64. Listings with a yellow question mark need an update (see **FIGURE 7**). But other drivers may be out of date as well. When I reinstalled Windows 98 and Me, my video card was assigned a generic VGA-card driver and didn't complain (although my graphics looked terrible until I updated the driver).

To reinstall a driver, double-click its listing in Device Manager and choose **Driver•Update Driver**. Select the option in the Hardware Update Wizard that lets you choose the location of the search and select the driver (the wording varies). Uncheck the option to search floppies, CDs, and other removable media, and direct the wizard to look in the folder **c:\olddrivers**. Click **Next** and follow the prompts.

If you are prompted to insert a particular CD, click **OK** and point to **c:\olddrivers**, which is where your drivers are stored. If that doesn't work, simply tell the installer

to skip that file. The driver will likely install properly despite Windows' inability to find that specific file. However, if the device doesn't work, dig out the CD that came with it and load the driver from it. When all the drivers are in place, delete the **c:\olddrivers** folder, or move it to a removable medium for safekeeping.

Your applications are still on your hard drive and listed on your Start menu (that is, unless your restore CD reformatted your hard drive), but most of them won't work because Windows can't see them yet. Reinstall the applications that don't open when you try them. If you no longer want a program, delete its shortcut from the Start menu and remove its folder from the Program Files folder. You don't have

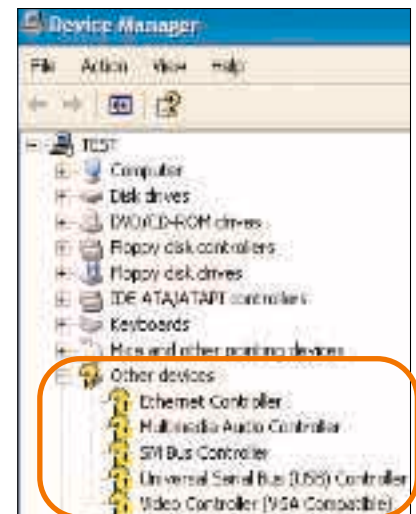


FIGURE 7: Device Manager makes it easy for you to find the drivers that need to be replaced after you've reinstalled Windows.

to properly uninstall the app this time.

At some point, you may have to reactivate XP. Since your hardware hasn't changed, this should be no problem. And last but definitely not least, you should update Windows and your applications. Visit [find.pcworld.com/46286](http://find.pcworld.com/46286) for tips on installing XP's Service Pack 2. ■

*Contributing Editor Lincoln Spector writes the Answer Line column. To find his other technology and humorous writings, go to [www.thelinkinspector.com](http://www.thelinkinspector.com).*



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# Secret tweaks

**20** unexpected ways to unleash the true potential of the technology products you already own.

**By Jim Aspinwall**

YOUR NEIGHBORS ARE doing it. Your coworkers are doing it. There's no shame in doing it—even in broad daylight. I'm talking about hacking: your digital camera, your MP3 play-

er, your TiVo, your network, and of course your PC. If it has a plug, a jack, a battery, a cord, a chip, a disk drive, or a display, chances are it can be reprogrammed and tweaked in some way to give you more speed, advanced features, or greater storage—without your paying for a whole new unit.

Hacks can run the gamut from simple software downloads, to involved hardware swapping and modification that sometimes requires specialty parts. I'll point you in the right direction and walk you through the steps to get the goods, do the deed, and enjoy the secrets hidden within your gadgets. But first, a few important notes about safety and other considerations.

## HACKING CAVEATS

BE AWARE THAT many hacks will probably void the warranty of your system or of specific components, so until you get comfortable it's best to start hacking on

hardware you aren't too attached to. Also note that while some vendors are much more tolerant of hacks and tweaks than others—Intel and NVidia even provide you with some tools—many manufacturers take a harder line and try to make it as difficult for you as possible.

In any case, you'll want to take some precautions before you begin:

- First, back up any data you have stored on the device, or start with a fresh system—hacking can render your PC useless in a nanosecond but cost you hours of restoration time.
- Download and safely store the original firmware or drivers for a device, in case something goes wrong and you need to get your gadget back in working condition.
- When tuning up your PC, measure and test your system before you start and as you hack so that you can tell whether you're doing more harm than good. Check out "PC Benchmarks Tell the Speed Story" on page 76 to find out what to test and how.
- Disconnect the power before working inside the case of any device. Be careful not to drop or leave tools, screws, clips, loose wires, or extra brackets floating around inside the case; anything conductive could short out a critical circuit.

## PC HARDWARE

# Free Speed: Overclocking Your PC

## Performance Boosting Basics



**WANT A FREE SPEED BOOST** for your computer? Try a little overclocking—an enthusiast trick that PC tweekers have been using for years to get free speed out of their systems. Many of today's CPUs can run faster than they're rated to do, and getting that added performance is simply a matter of carefully changing some settings. Overclocking won't turn an ancient PC into a powerhouse, but it can help you squeeze every drop of performance out of your machine.

Two variables set the speed at which your CPU runs: the system bus speed, and the CPU's clock multiplier. To determine the CPU's actual operating speed, those two values are multiplied together. For instance, a bus speed of 100 MHz and a multiplier value of 5.5 translate to a CPU running speed of 550 MHz. This simple formula works with most Intel Celeron, Pentium II, Pentium III, and Pentium 4 chips, as well as with AMD chips.

Some motherboard and CPU combinations let you change one or both of those variables, setting a new speed for the CPU. Boost either setting and you're officially overclocking. In my experience, most CPUs and motherboards will run fine when overclocked 10 to 20 percent faster than the rated CPU speed. The bus speed setting may also affect the speed of the PCI or AGP bus, depending on which chip set the motherboard uses and how that chip set connects to all of the subsystems on the board.

The trick to overclocking is in knowing when to stop. Crank up the speed completely beyond the operating limits of the CPU, system bus, or RAM, and the PC will crash or freeze a lot. If you've set the clock too high on a system that holds the clock settings in BIOS, it may fail to boot, and you'll have to use the PC Setup program to reset the clock settings stored in CMOS RAM. (In some cases, you may have to reset the CMOS RAM more directly: Either remove the CMOS memory retention battery, typically a button-style cell, or move a jumper on the system board;

that jumper is often marked 'clear CMOS'.) If your PC uses switches or jumpers to set clock and multiplier values, you'll simply need to reset them to a slower speed.

Utilities like NVidia's NTune ([find.pcworld.com/46554](http://find.pcworld.com/46554)), among others I'll discuss below, make it easy to play around with



**FIGURE 1: Example of overclocking settings in a PC Setup program.**

settings, test them, and store certain configs for special occasions—say, when you want a power boost to win in Half-Life 2.

Some systems (mostly the name brands, such as Dell, Gateway, HP, IBM, and Sony) and many Pentium I, II, and III CPUs simply cannot be overclocked; the manufacturers hard-code clocking values into the components to minimize support calls.

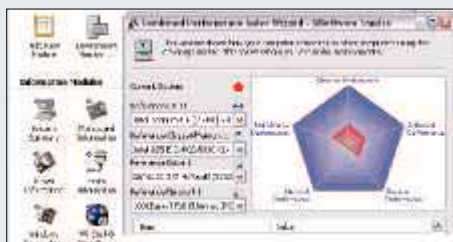
## CPU Overclocking the Easy Way



**MOST AFTER-MARKET MOTHERBOARDS** built within the past three to four years, such as those from Abit, Asus, MSI, or Tyan, have CPU clock settings available in the PC Setup program stored in the BIOS chip. As your PC boots, an on-screen message should indicate which key you hold down to enter the PC Setup program. Your motherboard manual should

PHOTOGRAPHS: RICK RIZNER

## PC Benchmarks Tell the Speed Story



**FIGURE 2: Performance testing with Sandra.**

SOMETIMES THE performance boost you get from overclocking will be obvious. But to see exactly what you've gained, you'll want to benchmark your processing power, memory transfer rates, graphics performance, and hard-drive speed.

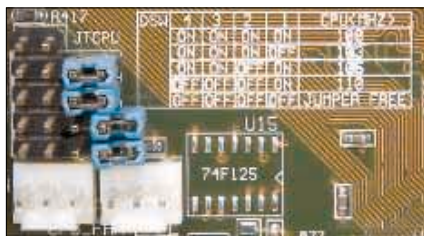
PC industry analysts and reviewers test overall PC performance with comprehensive, high-end programs such as

PC World's own WorldBench 5 suite (\$249, [www.worldbench.com](http://www.worldbench.com)) and VeriTest's benchmarks (free, [find.pcworld.com/46430](http://find.pcworld.com/46430)). Hobbyists and hackers will often use SiSoftware's Sandra utility suite (\$40, [www.sisoftware.net](http://www.sisoftware.net)) or FutureMark's \$20 3DMark and \$20 PCMark (both at [www.futuremark.com](http://www.futuremark.com)) to get more granular analyses.



explain how to find the parameters that control CPU speed.

The PC Setup program screen in **FIGURE 1** is from an Abit KA7 motherboard that offers lots of overclocking controls when the CPU Operating Speed is set to 'User Define'. The CPU FSB/PCI Clock setting also affects the speed of the PCI bus. I have found that most PCI cards will overclock about as well as the average CPU does.



**FIGURE 3 (above);  
FIGURE 4 (left).**

Overclocking the AMD Athlon XP+ 2600 processor on my ECS KT-600A motherboard involves just one setting. The multiplier in the Athlon XP+ 2600 processor is fixed at 11.5, allowing a CPU speed range between 1910 MHz ( $166 \times 11.5$ ) and 2288 MHz ( $199 \times 11.5$ ). The Athlon XP+ 2600 runs at 1900 MHz typically, but the chip I tested worked well when overclocked to 2200 MHz.

## CPU Overclocking by the Bits



BEFORE DESIGNERS MADE CPU speed settings changeable via software, switches or jumpers on the motherboard controlled the speed. You'll find this arrangement typical of early (3 to 4 years old or older) AMD, Pentium I and II, and Celeron boards. Overclocking with switches and jumpers works in the same way as using settings in PC Setup: You simply increment the multiplier and bus speed settings to speed up the processor until you find a reliable running speed.

The pictures in **FIGURE 3** and **FIGURE 4**, above, show the jumper posts for the CPU's frontside bus speed, with options ranging

from 100 MHz to 110 MHz. You can see the reference chart for the bus speed jumper settings silk-screened on the board (don't count on such a map being on the board—chances are you'll need a manual handy to properly set the jumpers and DIP switches). The CPU clock speed setting also affects the AGP bus speed on this board. Other motherboards use DIP switches (Figure 4) for both the CPU clock speed and the multiplier settings.

## 10-MINUTE TIP

### Radeon XT Platinum Hack



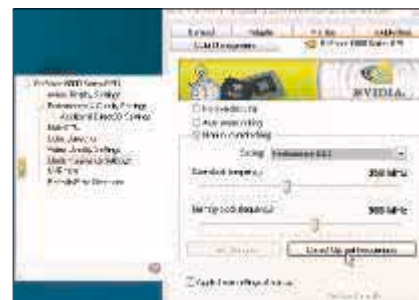
**SOMETHING FOR NOTHING** is a common theme among hacks. Sometimes flipping a bit or two can activate hidden power in your hardware, giving you a better product for free. In this case, the folks at I-hacked.com ([find.pcworld.com/46432](http://find.pcworld.com/46432)) have documented how to upgrade the firmware in the ATI Radeon X800 Pro to turn it into a zippier Radeon XT Platinum.

## Video Overclocking Made Easy



MOST OF THE OVERCLOCKING buzz is not about turning a PC into a supercomputer. Instead, it's about gamers being able to see, navigate, run, and shoot faster and smoother. Not surprisingly, you can overclock the processors on your graphics card in much the same way you would your main CPU. Video gaming has come a long way since Pong first appeared on TV-style monitors in the early 1980s. Even if you don't play video games, boosting the performance of your graphics system can enhance the enjoyment of videos and business presentations.

Your graphics speed boost comes from within, without your having to pop the case. To start, simply download the appropriate graphics board hacking tool for the brand of card you have. NVidia



**FIGURE 5: Overclocking an NVidia GPU.**

has even built overclocking settings into its latest drivers. To enable them, open the Windows Registry editor by going to *Start, Run*, typing **regedit**, and pressing *Enter*. Navigate to "HKEY\_LOCAL\_MACHINE/SOFTWARE/NVIDIA Corporation/Global/NVtweak/," right-click the right pane of the editor and choose to add a new DWord called **coolbits**. Edit that entry and give it a hex value of **3**, then close your Registry editor. The NVidia tab (**FIGURE 5**) under your PC's advanced display properties settings will now feature a ►

SiSoftware's Sandra (**FIGURE 2**) provides a huge amount of information about your system's CPU, memory, and I/O devices. It also includes a wide range of performance tests. I like to use Sandra for a quick gauge of my CPU, memory, and hard-drive speeds. For graphics I use FutureMark's 3DMark, which runs numerous tests of critical graphics pre-

sentation features, including different types of rendering and texturing, yielding a final aggregate 3DMark score. Running 3DMark is a video show in itself—you watch scenes from different video games and see displays of complex graphics. The combination of Sandra and 3DMark will give you a detailed reference point for judging your hacks.

“Clock Frequency Settings” page that allows you to adjust memory and graphics chip clock speeds for your board. Click the “Detect Optimal Frequencies” button if you want the utility to try to find safe overclocked settings for your graphics board.

ATI automatically provides a tab called “Overdrive” under Dis-

play Properties/Settings/Advanced for its Radeon-based cards. That tab handles basic overclocking, but for more granular control, you will need to download a utility. I prefer the free ATITool from [find.pcworld.com/46428](http://find.pcworld.com/46428). ATITool can automatically determine the fastest reliable speed for the card.

## OPERATING SYSTEM

# Make Windows More Efficient

### Advanced Windows Tweaks



WHEN I'M READY FOR some serious Windows hacking, I break out my copy of XQDC's \$8 X-Setup Pro from [www.x-setup.net](http://www.x-setup.net). X-Setup offers access to hundreds of novel, esoteric, and critical parameters that configure how Windows and many applications work. What's more, X-Setup Pro provides a lot of help so you can understand what the parameters are and whether they may have a negative impact on your system.

But before you dive into arcane Windows settings, there are some easier tweaks you can make. “Windows Rejuvenated” on page 60 is full of detailed tips on how to rejuvenate and restore zip to Windows. If you'd like to go deeper,

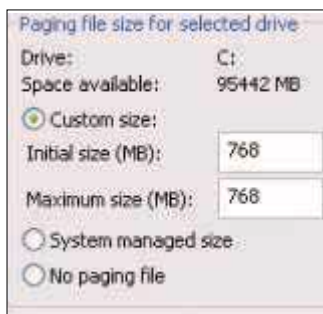


FIGURE 6: Setting the swap file size.

there are a few other settings you can modify to smooth your Windows experience. Your system will run more efficiently with a simple change to two important Windows file settings: the location Windows uses to store temporary files and the size and location of its paging, or swap, file (FIGURE 6).

### Two Key Settings



BEFORE YOU modify anything, clean some clutter off your hard drive:

1. Open *My Computer*, right-click your C: drive, and then select *Properties*.
2. Click the *Disk Cleanup* button, wait until the tool is done calculating, and then click OK and Yes to remove the litter. ▶

## Super-Customize the Appearance of Windows

IF YOU'VE GOT some speed to spare, you might want to try a radically customized Windows experience. Stardock's \$40 Object Desktop ([www.stardock.com](http://www.stardock.com)) includes programs that specialize in tweaking almost any aspect of Windows.

WindowBlinds (\$20 separately) lets you configure the

look of any Windows item, from backgrounds to title text to title and scroll bars—every possible color, font, texture, effect, and shadow can be customized and skinned. Dozens of pre-made skins are included.

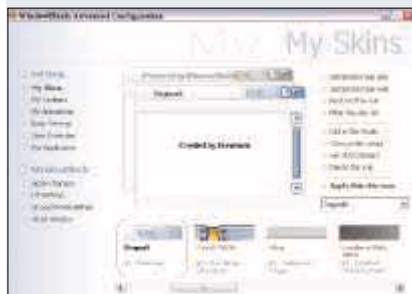
Don't like XP's Start menu? Object Desktop's ObjectBar component (\$20 separately)

lets you build a better one or create your own custom toolbars and program launchers.

And if you ever find yourself envying Mac OS X's supercool thumbnail-based task-switching feature, a couple of apps will bring that functionality to your Windows system. WinPlosion ([www.winplosion.com](http://www.winplosion.com)) is

probably the best, though you have to wonder how long Apple will allow someone to sell a \$10 shareware app that duplicates one of its key OS features.

Finally, once you have customized everything else, check out Stardock's free BootSkin—a quick and safe method to change the Windows boot logo.



WindowBlinds includes lots of built-in skins.



Find the right window on a cluttered desktop...



...by clicking one of WinPlosion's thumbnails.





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Even though it contains so much complex information, the Memory Advisor is surprisingly easy to use. Simply tell us the make and model of your system, and in just three clicks you'll know exactly what kind of RAM you need.

## Do you actually make the memory chips you sell?

Other memory companies may claim to manufacture memory, but what they actually do is just attach chips to a memory module—someone else makes the chips.

Why does it matter? Quality. Those other guys buy the cheapest chips they can find—often chips that haven't even been individually tested to make sure they'll work in your PC. If you install inferior memory, your computer might not boot. Or it might seem to work fine at first, but later experience mysterious crashes and error messages.

Crucial is the only consumer memory upgrade supplier that's part of a major DRAM manufacturer—we're backed by 26 years of Micron expertise. We actually make (and test) our own chips. In fact, because the world's leading computer manufacturers rely on our high-quality RAM, chances are good that the OEM memory in your system came from Micron. Crucial brings this same high-quality memory directly to you. It just costs less because you don't pay middleman mark-up fees.

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cost and Genuine!

3. Click OK to close the Properties dialog box.

Now it's time to start tweaking. To tame temporary files and set the swap file size in Windows 2000 and XP, do the following:

1. Right-click *My Computer* and select *Properties*.
2. Select the *Advanced* tab and then the *Environment Variables*



FIGURE 7: Temporary storage setting.

button.

3. In the Environment Variables dialog box, select TEMP and then TMP (FIGURE 7), and edit the values for those variables to point at an easily recognized

drive and folder location so you'll always know where they are. That will make it easy to clean out those files periodically. When you're done making those changes, click OK.

4. On the Advanced tab under Performance, click *Settings*.
5. In the Performance Options box, select the *Advanced* tab.
6. Under 'Virtual memory', click the *Change* button.
7. Select *Custom size*, enter the same value for the initial and maximum sizes, and click the *Set* button (Figure 6). I like to set the swap file at a fixed size of at least 1.5 times the amount of RAM the machine has, unless the computer I'm working on has a lot of RAM. For systems with 256MB of RAM, I use a 384MB swap file. With a roomier 512MB of RAM, I back off to a 512MB swap file, and at a comfortable 1GB of RAM, I stick with 768MB.
8. Close the dialog boxes by clicking OK, then restart Windows.

## 10-MINUTE TIP

### Lose the Bells and Whistles

↓ WINDOWS PROVIDES LOTS of tiny options and animations that let you customize how the OS looks. They may look great, but each eats a bit of system resources. I normally don't care for fancy background pictures and special effects, as they distract me from the real work—or play—I use my PC for, so I turn them off as follows:

1. Right-click the desktop and select *Properties*.
2. Select the *Desktop* tab and choose *(None)* at the top of the Background list.
3. Click the *Appearance* tab and then the *Advanced* button. Choose *Desktop* in the Item drop-down list and use the Color 1 drop-down menu to pick a color for the screen background.
4. Click OK twice to close the dialog boxes.
5. Right-click *My Computer* and then select *Properties*.
6. Select the *Performance* tab, and under Performance click the *Settings* button.
7. In the Performance Options dialog box, I choose Custom and deselect all of the sliding, fading, and animation options. I still get an attractive user interface but without the time-wasting special effects.
8. Click OK twice to close the dialog boxes.

## NETWORKING

# Optimize Your Net Connection

## Broadband Boost



BOOST YOUR network's reliability and speed by tuning two important network settings in Windows: RWIN, short for Receive Window, and MTU, or Maximum Transmission Unit.

You can use Regedit to set these values in the Windows Registry following the instructions from Annoyances.org ([find.pcworld.com/46436](http://find.pcworld.com/46436)), or you can download and run the free DrTCP (FIGURE 8) from [www.dslreports.com/drtcp](http://www.dslreports.com/drtcp).

The RWIN setting alters the TCP/IP received-data buffering on your PC—the more you have, the faster your downloads, within limits. Most users have found that an RWIN value of between 32768 and 65536 yields the speediest downloads (if you

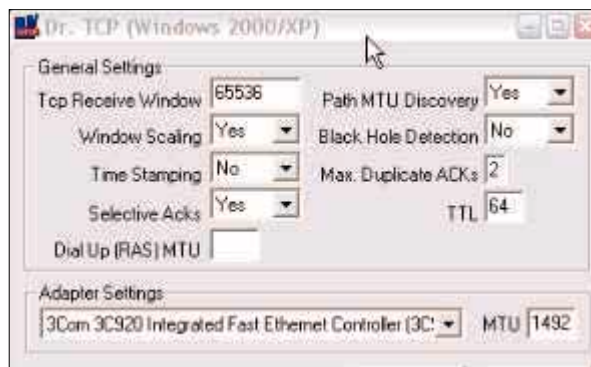


FIGURE 8: Tweak critical network settings with the free DrTCP app.

don't set this, RWIN defaults to four times the MTU value).

MTU sets the maximum size of data packets sent and received, and it must match the type of connection you have—dial-up, PPPoE (most DSL and cable), or LAN. The standard maximum value for TCP/IP is 1500, but for dial-up connections it should be 576 to ensure minimal packet fragmentation. For PPPoE, an MTU of no more than 1492 is recommend-

ed. Some ISPs and virtual private network connections require a setting as low as 1300 to allow for the differences in all the networking gear in the system and for data encryption overhead.

For a little extra oomph, also tweak the number of simultaneous connections your PC can make to one server. If you



## Which display are you?

				
<b>710N</b>	<b>711T</b>	<b>915N</b>	<b>910T</b>	<b>213T</b>
17" TFT	17" TFT	19" TFT	19" TFT	21" TFT
12ms response	1000:1 contrast ratio	8ms response	1000:1 contrast ratio	vertical mode
most popular size	most popular size	4 brightness modes	tiling	narrow bezel
applications: gamers video editors	applications: graphic designers art directors	applications: gamers stock traders	applications: paralegals web designers	applications: engineers architects

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**Jason Redmond (aka caliterp97)**  
Trader by day, gamer by night

Works with plasma rifles, rocket launchers  
and spreadsheets

**SAMSUNG**

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## Increase Your Wi-Fi Range

WIRELESS NETWORKING is one of the best things to happen to personal computing so far this century. But it isn't perfect, and many users expect a lot more range and a lot less interference. Unfortunately, you can't just buy a bigger, more powerful access point or Wi-Fi adapter because the FCC limits the power of such devices. Instead, you'll need to

use a better antenna at one or both ends to improve the signals and reduce interference.

Almost every wireless access point uses detachable antenna connections, but only a few Wi-Fi adapters provide external antenna connections—Orinoco/Avaya models are the most common (\$30 to \$80 price range). For these, you can purchase a connector called a pig-

tail adapter (most go for about \$20) and a suitable length of low-loss coaxial cable to connect to your choice of desktop or outdoor antennas. That will let you reach hotspots that are weak or distant from your card, or extend the range of the access point. I like to shop for Wi-Fi supplies at HyperLink Technologies ([www.hyperlinktech.com](http://www.hyperlinktech.com)), which offers one of the

most comprehensive selections of Wi-Fi hardware and helps you determine which cable adapters will fit your networking hardware.

For a quick-and-dirty way to extend your Wi-Fi range, try the Super Cantenna from [www.cantenna.com](http://www.cantenna.com), or build your own from a tin can and a few parts, following the directions at [find.pcworld.com/46438](http://find.pcworld.com/46438).

have a fast cable or DSL connection, boosting this setting from its default value of two to four or six can help pages load faster. Some Web servers limit you to two simultaneous connections, so you won't see a speed increase on all sites you visit.

You will have to restart Windows for the changes to take effect. Determine the settings recommended for your PC and test them using the Tweak Test at [www.dsreports.com/tweaks](http://www.dsreports.com/tweaks). It may take some time to find the best settings for your Internet connection.

## QUIET PCs

# Keep Your System Cool and Quiet

### Chill Your CPU, Dude



**SPEED BREEDS HEAT.** After you've tuned up your CPU, it's especially critical that you get as much heat away from the chip as possible, or you'll end up with a smelly blackened chunk of fried silicon. Most systems come with factory-approved heat sinks and fans suitable for running the chip at stock speeds, but such standard equipment may be inadequate for overclocking, and it's usually pretty loud. A new heat sink and fan can improve your CPU cooling while keeping your system

quiet. Zalman's \$50 CNPS7000B CPU cooler (**FIGURE 9**) works with many Athlon and P4 CPUs. And Thermaltake's \$40 CL-P0092 heat-pipe cooling system for P4 chips looks as cool as it works.

Heat sinks and fans are fine for most people; but at many overclocking and PC modder sites, water-cooling kits (ranging in price

from about \$100 to \$180) are all the rage. Liquid cooling worked for Cray's supercomputers, but in that case the entire machine was immersed in inert nonconductive liquid—not exactly a practical setup for home users. Most liquid-cooling systems for PCs circulate water across a heat pad atop the CPU and then pump and dump the heat outside. This method offers incredible cooling advantages for extremely overclocked CPUs, chip sets, and graphics cards. Make sure you have enough room in your case and around the CPU before you buy, however.



**FIGURE 9.**

### Juicier and Quieter



**ALL OF YOUR** enhanced CPU overclocking and PC tweaking can kill your power supply, as the souped-up parts try to suck more juice out of this obscure, little, wire-crammed box in the corner of your PC case. You need a power supply upgrade, and you need it now. What better way to complement your tricked-out PC than a cool and quiet new power supply with enough juice to keep every chip, drive, and light-emitting source humming along?

Power doesn't always have to be as noisy as the exhaust rattle from a modified Honda Civic. A handful of vendors now offer fanless supplies, such as the \$170 Antec Phantom 350-watt model (**FIGURE 10**). These units sport beefed-up internal heat sinks that provide enough cooling for the power supply without requiring you to use a noisy fan.



**FIGURE 10.**

### Pad Your PC for Quieter Operation



**NOW THAT YOU'VE** shushed your power supply, it's time to do the same to your PC. You can quit shouting over fan noise and speak in your "inside voice" if you replace a few key components. Temperature-sensing, speed-adjusting fans built into some current PC models make a nice first touch—



You have a printing emergency.  
Your printer has a printing error. Again.  
(Isn't it time for a printer you can rely on?)



You can't afford not to buy an HP printer.



#### HP LaserJet 1320 printer

- Print speed: up to 22 ppm black
- Resolution: 1200 x 1200 dpi
- RAM: 16MB std., 144MB max.
- Paper handling: 250-sheet input capacity
- Duty cycle: 10,000 pages per month
- 1-year limited warranty

**\$399<sup>99</sup>** PRINTER  
CDW 680841

**\$100** MAIL-IN REBATE  
AVAILABLE

#### HP Color LaserJet 3700n printer

- Print speed: up to 16 ppm black and color
- Resolution: HP Image RET 2400
- RAM: 128MB std., 448MB max.
- Paper handling: 350-sheet input capacity
- Duty cycle: 55,000 pages per month
- 1-year, next business day, onsite warranty

**\$1599** PRINTER  
CDW 573050

**400** INSTANT SAVINGS\*

**\$1199**

#### HP LaserJet 4101mfp

- 4-in-1 multifunction machine
- Print and copy speed: up to 25 ppm
- Printer resolution: HP ProRes 1200 (true 1200 x 1200 dpi) at engine speed
- RAM: 64MB std., 256MB max.
- Duplex printing
- Color scanner resolution: 600 x 600 dpi optical

**\$2499** MFP  
CDW 439296

**\$300** MAIL-IN REBATE  
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*"PC Selling Zone helps me get more money than I expected and the process was easier than I anticipated."*

**Coleman Andrews**  
- eBay User ID:  
calicoleman (19)

**There's a gold mine in your garage** (or maybe in your closet, or even on your desk). Whether trading in your current system for that hot upgrade, or just watching your old gear gather dust, you should try a great new free resource from PC World and eBay that makes selling your desktop or notebook super convenient.

We're talking fast, easy—and right from home. Simply go to eBay's new PC Selling Zone at [www.ebay.com/pcsellingzone](http://www.ebay.com/pcsellingzone) and use innovative no-cost tools designed to let you appraise your system's resale value, create a profile of your system for posting it on eBay and completely erase deleted files on your hard drive!

Need more? How about packaging and shipping services? eBay's new PC Selling Zone can even connect you with a local eBay expert to help with your sale.

Turn your clutter into cash now. Go to:

**[find.pcworld.com/46026](http://find.pcworld.com/46026)**

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over an area of 3 square miles.

**NOD32's industry leading  
advanced heuristics detects  
the viruses of tomorrow today.**

NOD32 is a record winner of Virus Bulletin  
100% Awards given for outstanding detection.  
Taking antivirus protection to new heights.

#### Detection rate

Information source:  
Virus Bulletin 6/2002 through 4/2004

performance index\*



\* Total number of misses in all test sets in both on-demand and on-access scanning (not to scale).

Windows is registered trademark of Microsoft Corporation. Symantec is registered trademark of Symantec Corporation. NetShield is registered trademark of Network Associates Technology, Inc.



Go to [find.pcworld.com/46098](http://find.pcworld.com/46098)

[www.nod32.com](http://www.nod32.com)

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**NOD32**  
antivirus system

try the \$6 Thermaltake A1214 if your machine needs replacements. But vibrations from fan and especially disk-drive rotation may still be enough to make you run screaming from the room.

Those large, flat-panel areas on the sides of your



FIGURE 11.

case can act as sounding boards for any noise inside your system. Put your ears at ease by installing vibration-dampening pads (FIGURE 11) from DampTek ([find.pcworld.com/46440](http://find.pcworld.com/46440); \$50 for a pack of three) on the inside of those panels.

## DIGITAL CAMERAS

# Hacking Pictures

## Turn your Canon EOS 300D Into a 10D



WITH A MERE file download and a simple firmware upgrade, your Canon EOS 300D can have many of the features of the much more expensive Canon 10D, including ASA settings over ISO 3200 (shown at left), a custom functions menu, shutter release without a CompactFlash memory card present, and more. (I-hacked.com explains this top-notch camera hack and details its full benefits at [find.pcworld.com/46442](http://find.pcworld.com/46442).)



Before you try this hack, grab a copy of the latest firmware upgrade from Canon's Web site, so you'll always be able to reinstall that firmware in case anything goes wrong. After that, performing the hack is a simple matter of following these steps:

1. Download the hacked firmware file by going to [find.pcworld.com/46444](http://find.pcworld.com/46444).

2. Use your camera to format a CF card that holds at least 8MB, then save the firmware on that CF card through your PC or Mac.
3. Insert the CF card into the camera.
4. Turn the camera on. It will recognize the firmware and give

## 10-MINUTE TIP

### Nevo-Based Remote Control for the Rebel



IF YOU HAVE a Canon EOS Digital Rebel and a Nevo-enabled PDA (most current IPaqs), you'll want to get the Rebel remote shutter control add-in for your PDA from CameraHacker ([find.pcworld.com/46450](http://find.pcworld.com/46450)). The site contains several other tricks that are worth checking out.

you directions on the LCD screen for how to proceed (basically you accept the new firmware and then restart).

## Reusable Dakota Camera Can Be a Hacker's Bargain



DO YOU THINK basic digital camera features should be more affordable? So do I. Start with a trip to your local Ritz Camera or discount store and pick up a \$20 reusable Dakota digital camera. You're supposed to buy a Dakota, use it, and then return it to the store to get your images printed. But with a few hacks, you can get the pictures out yourself.

John Maushammer has the Dakota well documented at his Web site ([find.pcworld.com/46446](http://find.pcworld.com/46446)), with details on how to hack a USB connection onto the camera. Once you can get pictures off the Dakota, head to [find.pcworld.com/46448](http://find.pcworld.com/46448) for instructions on removing the camera's built-in software limit of 25 pictures.

## AUDIO PLAYERS

# Store More Music

## Pack More Drive Into Your Creative Nomad Zen Player



WHETHER THE ORIGINAL 20GB hard drive in your Zen has crashed or you simply want to be able to pack more MP3 files into it with a bigger drive, replacing the Zen's hard drive requires little more than a small screwdriver and about 30 minutes. The Zen does all the hard work in its firmware, formatting the new drive so that it can store more MP3 files. Many Nomad-related forums mention this hack—and unlike with many hacks from techie forums, the conclusion in the real world is that this hack really is that simple. ►



FIGURE 12.





100% tested | guaranteed compatibility | free technical support | five-year warranty



## Kingston Safeguards Your Data.

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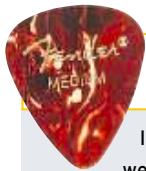
Don't compromise corporate data. Trust the USB Flash drive that offers airtight security — Kingston's DataTraveler® Elite. It combines 128-bit AES, hardware-based encryption with TravelerSafe+ software for dual-level security that protects even the most confidential data.

To learn more about the ultra-secure DataTraveler Elite, download a free copy of the DataTraveler Security and Performance White Paper at [kingston.com/digitalmedia](http://kingston.com/digitalmedia).



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## Save Your iPod With a Guitar Pick

IF YOUR IPOD gets wet, Apple suggests refraining from pushing buttons for a while so moisture doesn't creep inside. Users who have

self-recovered dunked iPods have left them turned off for 24 to 48 hours to dry out, charged them up, and carried on as usual. Opening the case should

accelerate the evaporation of any moisture tucked inside.

The simplest way to get inside the stainless-steel case is to use a guitar pick to wedge

and wiggle between the metal back and the plastic frame pieces to separate them, taking care to avoid damaging the connectors in the process.

Note: This hack will void your Zen's warranty.

The first step is to find an appropriate replacement or upgrade hard drive. Since Creative, the makers of the Nomad Zen, use commonly available 2.5-inch Fujitsu laptop hard drives, you should have no trouble finding a 20-, 40- or 60GB replacement at a well-stocked local computer shop or online retailer.

Make sure you have the Nomad Zen software installed on your PC before you begin, and transfer all your music to the PC first so you can load it back on the device when you're done.

With a new drive on hand, it's time to start the drive-ectomy on your Zen player. You will need a #0 or #00 cross-head screwdriver, steady hands, and a place to keep the parts from getting lost on the floor—a baking sheet works wonders. Set the player face down on a soft cloth to prevent marring the face. Then access and remove the current drive as follows:

1. Remove four screws that hold the Zen's back cover in place—two at the top and two at the bottom of the player.
2. Separate the cover from the body of the player. You will see the hard drive held in place with a metal retaining strap.
3. Remove the strap by prying the edges gently away from where they catch the player body at the top and bottom of the drive. Set the strap aside. It will be put back over the new drive.
4. Carefully lift the top end of the drive (at the opposite end from the connector) away from the player body and up to gain access to the flexible circuit and connector.
5. Gently pull the drive out by holding the flexible circuit and connector steady and rocking the drive slightly side to side.
6. At this point you will see the thin sheet of foam padding

(FIGURE 12) that provides the drive a modest amount of mechanical shock protection. Keep the padding in place.

That wasn't so bad now was it? You're almost halfway through the project and no doubt excited and eager to finish and fill up the new drive; but first we have to install and format it:

1. Once again holding the flexible circuit and drive connector steady, carefully plug the new drive into the connector.
2. Lay the drive into the player body.
3. Replace the metal retaining strap around the drive and



FIGURE 13.

securely snap it onto the player body (FIGURE 13).

4. Replace the back cover and secure it using the four screws you removed in the step above.

So far, so good.

The next steps to complete the hack and ready the player to take on music are much easier:

1. Connect the AC adapter to your player so you'll be sure to have enough juice to get the drive prepared, the player properly reconnected to your computer, and its firmware updated. Do not connect the USB or FireWire cable yet.
2. Power on the Zen. It should display a "rescue mode" menu. If not, hold down the Play/Pause button and reset the player.
3. Select option 2 (*Format All*). The "format" process takes but a few seconds. It's not really formatting the entire drive—just preparing it for the player's firmware, which you'll reload next.
4. Now connect the Zen to your computer. If you've previously installed the Nomad Zen software on your PC, Plug and Play should detect the presence and status of the player. The "ZenUniversalUpgrade" dialog should appear. If it doesn't, disconnect the player, reinstall the software, and then reconnect.
5. Select *Yes* to proceed with the firmware upload. After a few seconds you should be able to access the "JukeBox Information" to see the firmware version and the new storage capacity.
6. Load up your new drive with tunes and get jamming! ■

*Jim Aspinwall is an admitted hardware hacker and the author of O'Reilly's PC Hacks and McGraw-Hill's Installing, Troubleshooting and Repairing Wireless Networks.*

### 10-MINUTE TIP

#### Better Player Management for Windows



IF YOU'RE DISAPPOINTED in the synching software that came with your MP3 player, you're not alone. Red Chair Software ([www.redchairsoftware.com](http://www.redchairsoftware.com)), offers alternative player-management programs for lots of MP3 players, such as the \$35 Notmad Explorer (for most Creative players), Anapod Explorer (for Apple's iPod and iPod Mini), Riorad Explorer (compatible with an increasing number of Rio's players), and Dudebox Explorer (for Dell's players).



# CHEAP PCs: The Real Deals



**Yes,** you can pay  
a little and get a lot:  
We test 8 bargain-  
priced PCs to find the  
best of the bunch. ►

BY SEÁN CAPTAIN  
ILLUSTRATION BY JEFF BERLIN



## TEST Center

CHEAP PCS AREN'T what they used to be. Today's budget desktops can handle once-exotic tasks like ripping CDs, touching up photos, and editing simple videos, albeit a tad sluggishly. Might a few hundred dollars buy all the PC you need?

To find out, we tested low-cost systems from Compaq, Dell, EMachines, HP, IBuyPower, Polywell, Sys Technology, and WinBook. Prices for these offerings ranged from \$505 to \$750. Though not the very cheapest models on the market (we asked the vendors to configure the systems

with at least 512MB of RAM, and all but two of them did), their average price is only about half that of the value machines ranked in our latest *Top 15 Desktop PCs* chart on page 133. (Even Apple is getting into the act: As we went to press, it announced the Mac Mini, starting at \$499.)

We found many of these desktops fine for most home and office tasks, but less suitable for high-action gaming and heavy-duty graphics or audio work. Advanced users should look at the power machines in the Top 15, though they might also consider a budget box for family mem-

bers or employees with modest needs.

But even in this low price range, offerings vary among vendors, and every PC we reviewed involves sacrifices. On balance, we found Dell's Dimension 3000 to be the best deal. Its so-so performance was more than offset by the included LCD monitor and inkjet printer—all for \$505. See the chart below for our other picks.

### POSITIVE DEVELOPMENTS

SEVERAL AMENITIES once considered luxuries are now commonplace. For example, all the systems in this roundup

provide at least one USB 2.0 port on the front of the computer, where it is easy to reach, and every model has an ethernet port for a broadband Web connection. (Most also come with modems for dial-up.) The Compaq, Dell, EMachines, HP, and IBuyPower systems also feature front-mounted audio ports (convenient for plugging in headphones), and all except the Dell, Polywell, and WinBook systems come with multifunction card readers that accept media such as CompactFlash, Memory Stick, Secure Digital, and XD-Picture Card from digital cameras, PDAs, and other devices. The Compaq, HP, and IBuyPower PCs even have FireWire ports for plugging in digital video cameras or external hard drives.

While all the systems we reviewed provide at least a few options for upgrades, none can be transformed, swanlike, into dream PCs. Manufacturers typically keep costs low by using older technologies and limited components. For example, most systems here have 250-watt power sup-

## FEATURES COMPARISON

### TEST Center

## Top 5 Cheap PCs

THESE DAYS A BUDGET SYSTEM costs under \$750, handles basic office computing and photo editing, and has some room for upgrades. What you don't get: really big hard drives, top-of-the-line processors, and powerful game-playing graphics.

	SYSTEM	Features and specifications		Performance	Bottom line
1	<b>Dell Dimension 3000</b> <b>Best BUY \$505 (★★★★★)</b> <a href="http://find.pcworld.com/46200">find.pcworld.com/46200</a>	<ul style="list-style-type: none"> <li>• 2.4-GHz Celeron D 320</li> <li>• 40GB hard drive</li> <li>• 24X-48X CD-ROM drive</li> </ul>	<ul style="list-style-type: none"> <li>• 15-inch Dell LCD monitor</li> <li>• Integrated Intel graphics</li> <li>• No media card reader</li> </ul>	<ul style="list-style-type: none"> <li>• WorldBench 5 score: 62</li> <li>• Graphics: Fair</li> <li>• Design: Fair</li> </ul>	The bundled LCD monitor and printer make up for the system's feeble performance and limited upgrade options (for one thing, there's no AGP slot).
2	<b>IBuyPower LAN-Party Mini PC</b> <b>\$649 (★★★★★)</b> <a href="http://find.pcworld.com/46208">find.pcworld.com/46208</a>	<ul style="list-style-type: none"> <li>• 2-GHz Athlon 64 3000+</li> <li>• 80GB hard drive</li> <li>• 32X-52X CD-RW drive</li> </ul>	<ul style="list-style-type: none"> <li>• 17-inch ViewSonic CRT monitor</li> <li>• Integrated VIA graphics</li> <li>• Media card reader</li> </ul>	<ul style="list-style-type: none"> <li>• WorldBench 5 score: 80</li> <li>• Graphics: Poor</li> <li>• Design: Fair</li> </ul>	It's a high-performance bargain. But the cramped interior would complicate the graphics card upgrade we recommend to help this PC live up to its name.
3	<b>Compaq Presario SR1214NX</b> <b>\$550 (★★★★★)</b> <a href="http://find.pcworld.com/46190">find.pcworld.com/46190</a>	<ul style="list-style-type: none"> <li>• 2-GHz Athlon XP 2900+</li> <li>• 80GB hard drive</li> <li>• DVD-ROM/CD-RW combo drive</li> </ul>	<ul style="list-style-type: none"> <li>• No CRT monitor</li> <li>• Integrated VIA graphics</li> <li>• Media card reader</li> </ul>	<ul style="list-style-type: none"> <li>• WorldBench 5 score: 69</li> <li>• Graphics: Poor</li> <li>• Design: Very Good</li> </ul>	This handsome tower has lots of front connections and easy access for upgrades. But Compaq rated poorly in our Reliability and Service survey.
4	<b>EMachines T2984</b> <b>\$720 (★★★★★)</b> <a href="http://find.pcworld.com/46204">find.pcworld.com/46204</a>	<ul style="list-style-type: none"> <li>• 2.93-GHz Celeron D 340</li> <li>• 80GB hard drive</li> <li>• DVD-ROM/CD-RW combo drive</li> </ul>	<ul style="list-style-type: none"> <li>• 17-inch EMachines CRT monitor</li> <li>• Integrated Intel graphics</li> <li>• Media card reader</li> </ul>	<ul style="list-style-type: none"> <li>• WorldBench 5 score: 67</li> <li>• Graphics: Poor</li> <li>• Design: Very Good</li> </ul>	Despite EMachines' pleasing Reliability and Service record, this model didn't wow us. The monitor was a blurry disappointment, and the PC lacks an AGP slot.
5	<b>Polywell Poly 880NF2-MX</b> <b>\$630 (★★★★★)</b> <a href="http://find.pcworld.com/46210">find.pcworld.com/46210</a>	<ul style="list-style-type: none"> <li>• 1.58-GHz AMD Sempron 2300+</li> <li>• 80GB hard drive</li> <li>• DVD-ROM/CD-RW combo drive</li> </ul>	<ul style="list-style-type: none"> <li>• 17-inch ViewSonic CRT monitor</li> <li>• Integrated NVidia graphics</li> <li>• No media card reader</li> </ul>	<ul style="list-style-type: none"> <li>• WorldBench 5 score: 71</li> <li>• Graphics: Fair</li> <li>• Design: Fair</li> </ul>	This basic black box had the best gaming frame rates of the lot and offers Creative SBS15 speakers. Bad interior design makes upgrades cumbersome.

**CHART NOTES:** Street price as of 12/15/04. Features listings are not exhaustive. Go to [find.pcworld.com/46478](http://find.pcworld.com/46478) for reviews of systems that didn't make the chart, as well as a breakdown of the weightings we give to the factors contributing to a PC's rating. All tests designed and conducted by the PC World Test Center. All rights reserved.



plies that are adequate to run the PCs as configured but don't provide much room for growth. And most of the motherboards support neither top-tier AMD and Intel processors nor the fastest RAM. Although most of our test PCs have slots for adding an AGP graphics board, they don't use the new PCI Express system bus for maximum performance from the latest and fastest graphics cards.

Even some of these basic computers, however, provide leeway for tweaking features and performance through component upgrades, either during the initial configuration or after they arrive.

Another trend is improved aesthetics. Though certain models are fancier than others, even the most basic contenders look good. Gone are the chintzy putty-colored cases that identified bargain systems of the past. For example, the HP Pavilion A706n's case is silvery lavender with dark gray. Otherwise, basic black, with gray or silver highlights, is the standard-issue uniform. And for some brands, such as the Compaq Presario series and the HP Pavilion series, the low-end models sport the same smart-looking cases as their upscale siblings.

## CPU and RAM

**SPEED COSTS MONEY.** So the relatively low WorldBench 5 scores of these systems did not surprise us. Their low performance is largely due to their entry-level CPUs (for details, see the chart on the opposite page). IBuyPower's LAN-Party Mini PC was the fastest of the bunch, but its WorldBench 5 score of 80 is still about 10 points below the average for PCs tested in our Top 15 review. Most other units here hovered in the high 60s and low 70s. The Dell Dimension 3000, the Sys Technology Sys TaskMaster S2600+, and the WinBook PowerSpec 4988 were another

run down, turning in WorldBench 5 scores of 62, 60, and 59, respectively.

In all fairness, though, the collection of tests in WorldBench 5 represents nearly every duty a PC might be called upon to perform, including some jobs you would not expect a budget model to handle. For

in many of the budget PCs are too small to show up in casual usage. For example, most of the systems applied a simple filter effect to photos in Adobe Photoshop Elements about as quickly as did a high-end comparison PC, a Gateway 5200XL with a 3.2-GHz Pentium 4 processor, 512MB



instance, every system bombed in tests using Discreet 3ds Max, a program for modeling and animating 3D characters and objects. But you probably wouldn't try to use one of these PCs as a workstation for creating the next *Shrek*.

Amateur videographers might want to use an entry-level video editing package like Roxio VideoWave, which is also included in WorldBench 5. The budget systems did fine in our VideoWave tests, but most were still below the average score for all PCs we've recently tested.

The budget systems also took a beating in a WorldBench 5 multitasking test that consists of loading Web pages in Mozilla while encoding music and video clips with Windows Media Encoder. But several of the models came close to the PC World average for the everyday task of switching between applications in Microsoft Office 2002, as well as for ripping MP3s with Musicmatch Jukebox.

In addition to WorldBench 5 evaluations, we did some informal speed tests. We found that performance deficiencies

of DDR400 SDRAM, and a 200GB Serial ATA hard drive. The same high-end system was up to about twice as fast at applying a complex filter, however. It was also far faster than most of the budget systems at ripping a CD in iTunes, which might matter if you want to digitize your entire CD collection over the weekend, but not if you just rip a disc now and then.

Whatever processor you have, pairing it with sufficient RAM is essential to overall performance. While several of these systems are available at a lower cost with 256MB of RAM, we asked each manufacturer to outfit its test PC with 512MB of memory, the minimum we recommend for Windows XP users. Sys Technology and WinBook, however, submitted systems with 256MB of RAM, and they had the two lowest WorldBench 5 scores. Equipped with 512MB of RAM, the Polywell Poly 880NF2-MX was the second-fastest budget system in the group, with a WorldBench 5 score of 71. As a test, we removed half the RAM, and its score dropped significantly to 67. ►

## Storage

HARD DRIVES CAN have a dramatic effect on performance in some systems. Today's fastest drives use the Serial ATA interface, but none of these budget desktops come with a SATA drive. Instead, they have Parallel ATA drives capable of spinning at a decent 7200 rpm—cutting-edge technology about two years ago.

Most of our test systems include an 80GB hard drive—plenty of room for any assortment of applications, plus good-sized music and digital photo collections. However, folks who have even more pictures and tunes, or a lot of video clips, should consider investing not only in a larger hard drive but also in a more powerful PC for its data-processing abilities.

One small-budget scenario that might

demand more storage would be using the PC as a low-cost server to store backups or a music collection for a home, or to centralize files for a small office. For networking, each of these systems has an ethernet port and spare PCI slots for adding a Wi-Fi card, plus ports for attaching a USB-based Wi-Fi adapter.

If you're looking for high-capacity storage, you might be better off buying a dedicated network-attached storage appliance like the Buffalo LinkStation Network Storage Center or the Snap Appliance Snap Server 1100 (for more information, see last month's "Net Drives," [find.pcworld.com/46468](http://find.pcworld.com/46468)). But the PC can offer more storage and expansion options, plus the ability to double as a low-end workstation.

If you anticipate needing additional storage, it's best to spend the money for it

up front. Ordering the Dell Dimension 3000 with an 80GB drive instead of the 40GB one we received costs a mere \$18 more. But adding a 40GB drive later can cost about \$60, plus labor (likely your own). Unfortunately, some vendors sell fixed budget-PC configurations with no upgrade options at time of purchase.

The options are more plentiful for optical drives. Most of the systems come with a DVD-ROM drive, a CD-RW drive, or both (sometimes a combination unit). The WinBook PowerSpec 4988 even has a DVD writer (alas, the system didn't make our Top 5 list due largely to slow overall performance). CD-R/RW capabilities are virtually a must for archiving or passing along data—especially since floppy drives are disappearing. (Only the Polywell includes a floppy drive.) And ►

### BUDGET PORTABLES

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## Cheap Notebooks: What You Get and What You Don't



THOUGH THE PRICE is right on the \$899 Dell Inspiron 1150 and the \$849 HP Pavilion Ze2000, you won't get the speed and handy extras—such as media card readers and Bluetooth—of higher-priced (\$1500 and up) portables. The question is whether you'll be happy with what you're getting and comfortable with what you're not.

You can expect the basics. Both laptops provide ports for USB 2.0, ethernet, headphones, a microphone, and a modem, as well as a PC Card slot. The Pavilion Ze2000 ([find.pcworld.com/46572](http://find.pcworld.com/46572)) has a FireWire port; the Inspiron 1150 ([find.pcworld.com/46242](http://find.pcworld.com/46242)) omits that, but it does have 802.11g wireless. The optical drives are fixed rather than removable, so the notebooks are heavy. The 1150 has a DVD-ROM/CD-RW combo drive; the Ze2000, a solo DVD-ROM drive. You get a few good software packages, too: The Ze2000 has Microsoft Office 2003, Works, and Sonic RecordNow. The 1150 has WordPerfect Productivity Pack.

Expect decent but not great battery life. The Inspiron lasted a respectable 3 hours, 41 minutes in our tests, while the Pavilion managed an underwhelming 2 hours, 12 minutes.

The fairly predictable bad news: Both laptops take a hit in performance, offering Celeron processors rather than the more powerful

Pentium M. The HP, with a 1.4-GHz Celeron M 360 CPU, earned a WorldBench 5 score of 62. The Dell, with a 2.6-GHz Celeron chip, was slower, garnering a WorldBench 5 score of 54. In comparison, notebooks with a 2-GHz Pentium M 755 have earned WorldBench 5 scores of 83 to 97—but they cost \$2000 and up.

Both notebooks come with limited storage capacity, offering 40GB hard drives. The units also lack ATI Mobility Radeon or



NVidia GeForce Go graphics chips, providing instead Intel graphics using main memory. The absence of dedicated graphics memory doesn't adversely affect basic office apps, but the integrated graphics are insufficient for serious video editing and gaming.

—Narasu Rebbapragada



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DVD-ROM drives are essential for watching movies on DVD and for installing large applications such as Microsoft Encarta Reference Library Premium 2005 and DeLorme Street Atlas USA 2005 Plus. All the budget systems had enough power to play movies smoothly in our tests.

Several PCs make it easy to upgrade components. The Compaq, HP, and Sys Tech PCs, for instance, open via thumbscrews and allow you to unlock and remove drives by flipping latches rather than using a screwdriver. Other systems are less helpful: The WinBook, for example, requires you to do some work to remove both side panels and four mounting screws that anchor the optical drive.

## Graphics and Sound

BUDGET COMPUTER MAKERS typically save money by eschewing sound cards and graphics cards with dedicated video memory in favor of basic processors integrated on the motherboard and dependent on system memory. However, today's integrated graphics systems do surprisingly well for most tasks, offering full color depth for movies and photo editing.

All the budget PCs we reviewed except the Sys TaskMaster could support 1600-by-1200 resolution, enough for a 21-inch monitor. The Sys topped out at 1024 by 768, about right for a 17-inch CRT; at the flickering 60-Hz setting, though, it can go up to 1280 by 1024. Except for the Dell and the EMachines, all the PCs here offer an AGP slot for adding a graphics card, which can make a big difference.

These systems can run 3D action games, but not fast enough to make them enjoyable. For example, frame rates in Unreal Tournament 2003 at 1024 by 768 resolution and 32-bit color were painfully slow, ranging from an almost palatable 44 frames per second on the Polywell to an abysmal 6 fps on the Compaq and the HP. Evaluations by the PC World Test Center show that 30 fps is acceptable for first-person shooter games but 60 fps is required for smooth play. On several of the budget machines, complex textures broke up at times, making scenes look blocky. Worse, the graphics sometimes couldn't keep up with game play. By the time you see an opponent aiming at you, he may have already fired a fatal shot.

Low-impact games, however, were no problem. In our informal tests, all the PCs offered smooth play in the popular The Sims 2 and the movie-inspired ►

## BARGAIN HUNTING

### Refurbished PCs: Cheap, Capable

ANOTHER WAY to save money on your next PC is to consider a refurbished system with higher-grade features. It's a computer with a little history.

"Refurbished" means the PC came back to the factory for any of a number of reasons, from faulty components to buyer's remorse. "If [customers] don't like something, they'll just take it back," says Elaine Gasser, a director of consumer PC remarketing at HP.

Because of quick turnaround, you can sometimes find refurbs that are identical to new models but far cheaper. For instance, at press time Dell offered a refurbished Dimension 4700 carrying a 3-GHz Pentium 4 530 processor, 512MB of RAM, an 80GB SATA hard drive, and Microsoft Office 2003—all for \$624.

Purchased new it would have cost \$1013. But can you rely on a refurb?

According to several of the major PC makers, all returned PCs go through inspection, repair, and testing. This involves wiping the hard drive and reinstalling the OS and apps, and it may include rebuilding the PC. Vendors say that any blemishes will be slight, such as minor scuffs or discoloration.

Warranty coverage varies. Dell presents the same warranty options for new and refurbished models. HP, however, sells refurb systems with a meager 90-day policy. HP does offer extension options for about \$150.

Vendors also allow unconditional returns shortly after purchase of a refurbished computer. Dell will take a system back in the first 14 days, Gateway in the first 15, and HP in the first 30. So the risks are fairly small, but the rewards can be big.

—S.C.





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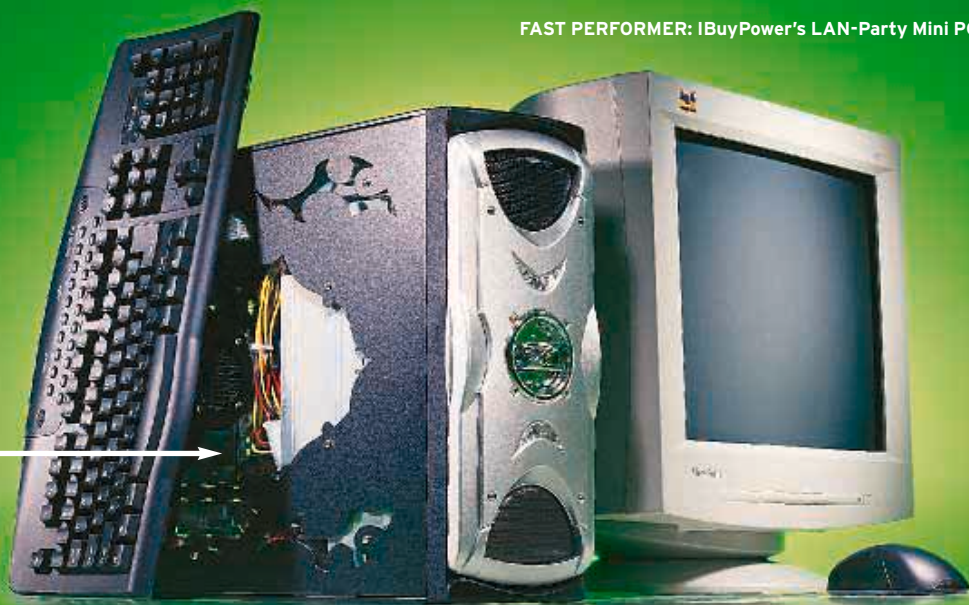
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THE SLIM tower case contributes to a cramped interior and difficult upgrades.



FAST PERFORMER: IBuyPower's LAN-Party Mini PC.



title *The Incredibles*: When Danger Calls.

Integrated audio suffers even less compromise. These low-cost PCs provide analog output for stereo, and all but the Dell and the EMachines support 5.1 surround sound that will produce impressive results if paired with midrange speakers (such as Logitech's \$60 X-530) or if fed into a good home theater system. Integrated audio has no effect on digital music sent to a sound system via a wired or wireless streamer like the Apple Airport Express with iTunes; in that case, the audio processing takes place in the streamer itself, not the PC. For audiophiles who desire a beefier setup, these budget systems offer a few free PCI slots that can accept a sound card, such as the \$80 Creative Sound Blaster Audigy 2. Adding a sound card should automatically disable the integrated audio; at worst you'll have to change a BIOS setting or adjust a jumper on the motherboard.

## Peripherals

WHILE MOST OF THE systems we received came with a monitor, the offerings varied. Dell was the most generous, bundling a 15-inch LCD with its \$505 sys-

tem. The E153FPB screen displayed bright images and fairly rich colors, as well as the sharp text that we expect from any flat-panel monitor. However, the LCD presented a very narrow vertical viewing angle—colors and brightness changed with even a slight head movement. Such an issue would cause no difficulties during most everyday tasks, but it would preclude color-sensitive graphics work.

IBuyPower bundled the ViewSonic E70FB, a fine-looking 17-inch CRT with a flat screen. The other PCs we saw came with low-end 17-inch CRTs that displayed washed-out colors, and some had glare-catching rounded faces.

We gave the vendors the option of not bundling a monitor, and Compaq and HP chose not to do so. This helped lower the prices of their PCs, but they still weren't the cheapest in the bunch. Getting a CRT would add about \$180 to either purchase.

All the keyboards were serviceable, and some were appealing. The Polywell, for example, included a well-designed Logitech Internet Pro and an optical mouse. Another nice extra was the inkjet printer included with the Dell Dimension 3000. But there was a catch: When we bought the PC, the USB cable cost an extra \$22 (a generic one would be a few bucks less).

## Extras

LIKE A CAR WITHOUT wheels or a flashlight without batteries, some budget PCs require additional investment before they are ready to use. So don't assume that the first price you see is what you will end up paying. For instance, many of the budget systems lack essential software such as antivirus protection (though some come with trial versions).

Only the Sys and WinBook PCs included the full version of an antivirus product. A good security package, such as Trend Micro PC-cillin Internet Security 2005, costs about \$50. You may also need to purchase productivity software. The Dell and Sys computers offered a version of Corel WordPerfect; the Compaq, EMachines, and HP systems were bundled with Microsoft Works. The IBuyPower, Polywell, and WinBook PCs lacked an office suite. You can upgrade, of course—but expect to pay up to \$150.

When adding features, beware the barrage of "upsells." Configuring and buying our Dell system required clicking through four Web pages bearing offers for more than two dozen extra hardware items, software packages, and training and



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installation services. The pages even recommended upgrading to the Microsoft Windows XP Media Center OS—overkill for a budget desktop with integrated graphics that can't handle the tasks for which you buy a Media Center PC. And Dell's online configurator automatically bumped customers up to a two-year warranty (an extra \$27); we had to manually specify the standard, one-year policy.

Also, watch closely for hoops you must jump through to get a system at the advertised price. Compaq, EMachines, and HP

list prices after rebate on their sites. Vendors love rebates because not every customer will bother to send in the paperwork. (For cautionary tales, read "Rebate Roulette" at [find.pcworld.com/46470](http://find.pcworld.com/46470).) For this reason, the prices we list for products do not take rebates into account. Note, too, that some vendors offer short-term specials. The bargain you saw while shopping online Friday may not be there when you come back to buy on Monday.

Ultimately the old saying about getting what you pay for still applies when buying

a PC: Saving money involves some compromises. But with overall improvements in technology, the trade-offs for budget PCs are far more palatable today than in years past. Entry-level models can offer substantial savings and a pleasant surprise in capabilities, provided that you are clear about what you need and realistic about what you can expect. ■

*Seán Captain is a freelance journalist who specializes in technology. Narasu Rebbapragada is an associate editor for PC World.*

## ALTERNATIVE OS

# Budget Linux PCs: Too Cheap for Their Own Good?



LINUX'S REPUTATION FOR running lean encourages vendors to pair it with very low-end systems. The result: a radically cheap PC, such as the \$200 Microtel PC SYSWM4005 or the \$280 GQ 3111.

As you might expect, such machines offer entry-level features. The Microtel we reviewed comes with a Sempron 2200+ CPU, a 20GB hard drive, 128MB of RAM, and Xandros Linux (available at Wal-Mart, [find.pcworld.com/46472](http://find.pcworld.com/46472)). The GQ 3111 from regional retailer Fry's Electronics (and at Outpost.com, [find.pcworld.com/46474](http://find.pcworld.com/46474)) is equipped with an Athlon XP 2000+ CPU, a 40GB hard drive, 128MB of RAM, ethernet, a modem, and the Linspire OS.

The Linux-based Linspire and Xandros operating systems resemble Windows, with similar icons, menus, and shortcuts. Both feature a button similar to Windows' Start that you click to access pop-up menus for launching applications or tweaking the OS.

Both distributions also offer software in a way that might surprise Windows users: via links to installed apps and to others you may download online. The selection for both companies is surprisingly good. Both systems come with versions of the Mozilla Web browser and OpenOffice, a suite of applications compatible with Microsoft Office. The Microtel Xandros PC also includes a handy image editor called The GIMP.

In our hands-on tests, the biggest disappoint-

ment with these PCs was their abysmal performance. Linux may not require as much power as Windows does, but it demands more than these systems provide. Booting up and launching apps went agonizingly slowly, as did performing basic operations. For example, rotating a photo, which occurs nearly instantaneously in Photoshop Elements on most Windows-based budget PCs, took over 10 seconds in The GIMP on the GQ 3111 Linspire system. When we boosted the machine's RAM from the included 128MB to 512MB, the excruciating delays disappeared, but CPU-intensive tasks still dragged; ripping a CD took about twice as long on the GQ Linspire as on the other PCs, regardless of the amount of RAM. The Microtel Xandros system was even more feeble than the GQ Linspire—it was barely able to run two applications at once.

Considering such disappointing performance, we don't recommend either of these ultracheap Linux machines, though Linux is probably not the culprit. The hardware is simply too wimpy. In the end, it doesn't pay to go rock-bottom cheap. —S.C.



**BASIC BLACK:**  
The GQ 3111 (far left) and the Microtel SYSWM4005.



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INTEL® PENTIUM® M PROCESSOR 735  
(1.70GHz, 2MB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP TABLET PC EDITION  
1GB DDR333 SDRAM, 80GB<sup>1</sup> HARD DRIVE  
AND MODULAR DVD-DUAL DRIVE (DVD+/-RW)  
(LX.T280E.183)

**UNBEATABLE VALUE!**

**Acer TravelMate C302XCi-SP2**

**\$1,699**

INTEL® PENTIUM® M PROCESSOR 725  
(1.60GHz, 2MB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP TABLET PC EDITION  
512MB DDR333 SDRAM, 60GB<sup>1</sup> HARD DRIVE  
AND MODULAR CD-RW/DVD-ROM COMBO DRIVE  
(LX.T280E.181)

**Acer® EasyPort**



**Acer EasyPort Port Replicator III**

**\$99**

COMPATIBLE WITH THE TRAVELMATE 8100, 8000, 6000, 4500,  
3200, 800, 660, C300, C110 AND FERRARI 3400  
(LC.T4101.004)

## Compare Monitor Prices/Features & You'll Choose Acer



**Acer AL2032wd**

- 20.0" TFT LCD
- 1680 x 1050 native resolution
- 600:1 contrast ratio
- 178° horizontal viewing angle
- 178° vertical viewing angle
- 2 x 5.0W integrated speakers
- VGA, DVI-D, signal connectors
- 300 cd/m<sup>2</sup> brightness
- 16ms response time
- Black color

**NEW!**

**Acer AL2032wd**

**\$759**

20.0" LCD



**Acer AL1914smd**

- 19.0" TFT LCD
- 1280 x 1024 native resolution
- 500:1 contrast ratio
- 140° horizontal viewing angle
- 140° vertical viewing angle

Prices shown are estimated street prices and do not include tax or shipping. Retailer or reseller prices may vary.

**TEAM LinG - Live, Informative, Non-cost and Genuine!**



Acer recommends Microsoft® Windows® XP Professional.

## Acer® TravelMate® 3200

### Dressed for Professional Success

This travel-friendly notebook in the elegant new Acer Folio design weighs in at a mere 4.5 pounds with its optical drive and battery installed but packs enough power and features to be your desktop-replacement system. Add the optional EasyPort Port Replicator III and you can quickly connect/disconnect from your printer and other office tools.



**MOBILE  
TECHNOLOGY**



- Intel® Centrino™ Mobile Technology
  - Intel® Pentium® M Processor
  - Intel® 855GME chipset
  - Intel® PRO/Wireless 2200BG network connection
- Microsoft® Windows® XP Professional
- 512MB DDR333 SDRAM
- 100GB<sup>1</sup> hard drive
- Modular DVD-Dual drive (DVD+/-RW)
- 3-in-1 card reader
- 14.1" XGA (1024 x 768) TFT display
- ATI® MOBILITY™ RADEON® 9700 graphics, 64MB DDR
- 802.11b/g WLAN, gigabit LAN, V.92 modem
- One-year limited warranty<sup>2</sup>

#### Acer TravelMate 3204XMi-XP

**\$1,899**

INTEL® PENTIUM® M PROCESSOR 745  
(1.80GHz, 2MB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL  
(LX.T4806.110)

## Acer® TravelMate® C110

### Compact, On-The-Go Tablet

You can use the innovative Acer TravelMate C110 like a clipboard by writing directly on the display with the included EMR pen or stylus. When you're ready to use the keyboard, just flip the display and you have a full-functioned notebook computer weighing just 3.2 pounds (without external drive). What could be more convenient?

- Intel® Centrino™ Mobile Technology
  - Intel® Pentium® M Processor
  - Intel® 855GME chipset
  - Intel® PRO/Wireless 2100A network connection
- Microsoft® Windows® XP Tablet PC Edition
- 512MB DDR333 SDRAM
- 10.4" XGA (1024 x 768) TFT display
- Intel® Extreme Graphics 2
- 802.11b/g WLAN, Bluetooth™, 10/100 LAN, V.92 modem
- One-year limited warranty<sup>2</sup>

#### Acer TravelMate C112TCi-SP2

**\$1,599**

INTEL® PENTIUM® M PROCESSOR ULV 733  
(1.10GHz, 2MB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP TABLET PC EDITION  
60GB<sup>1</sup> HARD DRIVE AND EXTERNAL  
CD-RW/DVD-ROM COMBO DRIVE  
(LX.T270E.280)

#### Acer TravelMate C112Ti-SP2

**\$1,399**

INTEL® PENTIUM® M PROCESSOR ULV 733  
(1.10GHz, 2MB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP TABLET PC EDITION  
AND 40GB<sup>1</sup> HARD DRIVE.  
OPTIONAL EXTERNAL COMBO DRIVE  
(LX.T270E.278)



**NEW!**

#### Acer AL1914smd

**\$399**

19.0" LCD



#### Acer AL1912b

- 19.0" TFT LCD
- 1280 x 1024 native resolution
- 500:1 contrast ratio
- 140° horizontal viewing angle
- 140° vertical viewing angle

- VGA signal connector
- 250 cd/m<sup>2</sup> brightness
- 16ms response time
- Black color

**\$44 PRICE CUT!**

#### Acer AL1912b

**\$325**

19.0" LCD

Prices shown are estimated street prices and do not include tax or shipping. Retailer or reseller prices may vary.

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# acer



## Acer® TravelMate® 2300 Maximum Mobility, Affordable Price

The **Acer TravelMate 2300** is designed to deliver high performance in a portable package that's both appealing and affordable. This all-in-one notebook with integrated wireless connectivity and 15.0" viewing area has the comprehensive feature set and flexibility needed for a busy lifestyle like yours.

- Intel® Celeron® M Processor
- Microsoft® Windows® XP Professional
- 512MB DDR266 SDRAM
- 60GB<sup>1</sup> hard drive
- Integrated CD-RW/DVD-ROM combo drive
- 15.0" XGA (1024 x 768) TFT display
- Intel® 852GM chipset with integrated Dynamic Video Memory Technology (DVMT)
- 802.11b/g WLAN, 10/100 LAN, V.92 modem
- One-year limited warranty<sup>1</sup>



*Perfect balance of  
price & performance*

**NOW MORE AFFORDABLE!**

**Acer TravelMate 2303LCi-XP**

**\$849**

INTEL® CELERON® M PROCESSOR 340  
(1.50GHz, 512KB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL  
(LX.T5706.153)

## Compare Monitor Prices/Features & You'll Choose Acer



### Acer AL1732d

- 17.0" TFT LCD
- 1280 x 1024 native resolution
- 500:1 contrast ratio
- 140° horizontal viewing angle
- 140° vertical viewing angle
- 2 x 2.0W integrated speakers
- VGA, DVI-D, signal connectors
- 400 cd/m<sup>2</sup> brightness
- 12ms response time
- Black color

**NEW!**

**Acer AL1732d**

**\$359**

17.0" LCD



### Acer AL1715smd

- 17.0" TFT LCD
- 1280 x 1024 native resolution
- 500:1 contrast ratio
- 150° horizontal viewing angle
- 135° vertical viewing angle

Prices shown are estimated street prices and do not include tax or shipping. Retailer or reseller prices may vary.

**TEAM LinG - Live, Informative, Non-cost and Genuine!**



Acer recommends Microsoft® Windows® XP Professional.

## Acer® Aspire™ 1800

### Desktop Power in Mobile Form Factor

Let the **Acer Aspire 1800** be your portable entertainment and creativity center. Play the latest games, watch your favorite movies, edit videos or use power-hungry productivity applications. You won't miss one show-stopping moment on the 17.0" wide-screen display, and thanks to the ATI® MOBILITY™ RADEON™ X600 chip, you'll experience new levels of graphics performance. Instead of being tied to your desk, enjoy the best in multimedia all around your home.



- Intel® Pentium® 4 Processor with HT Technology
- Microsoft® Windows® XP Professional
- 512MB DDR333 SDRAM
- 80GB<sup>1</sup> hard drive
- 17.0" WXGA (1280 x 800) TFT display
- Integrated Super Multi Write Plus (DVD -RW, +RW, -RAM) drive
- ATI® MOBILITY™ RADEON™ X600 graphics, 64MB DDR
- 802.11b/g WLAN, Bluetooth™, gigabit LAN, V.92 modem
- One-year limited warranty<sup>2</sup>

#### Acer Aspire 1804WSMi-XP

**\$1,699**

INTEL® PENTIUM® 4 PROCESSOR 540 WITH HT TECHNOLOGY  
(3.20GHz, 1MB L2 CACHE, 800MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL  
(LX.A2906.009)

## Acer® TravelMate® 2700

### Performance Teamed with Practicality

Savvy users know that a wide-angle display can make work easier and enhance productivity. You'll see sharp text and crisp images on the **Acer TravelMate 2700's** 15.4" wide-angle LCD and have the convenience of viewing spreadsheets side by side on a single screen. Combining practicality with first-class performance, the **Acer TravelMate 2700** is an excellent choice for small/home offices and small-to-medium businesses as well as government/educational institutions.

- Intel® Pentium® 4 Processor
- Microsoft® Windows® XP Professional
- 512MB DDR333 SDRAM
- 80GB<sup>1</sup> hard drive
- Integrated CD-RW/DVD-ROM combo drive
- 15.4" WXGA (1280 x 800) TFT display
- ATI® MOBILITY™ RADEON™ 9000 graphics
- 802.11b/g WLAN, 10/100 LAN, V.92 modem
- One-year limited warranty<sup>2</sup>

**NEW MODEL! MORE POWER!**

#### Acer TravelMate 2701WLCi-XP

**\$1,199**

INTEL® PENTIUM® 4 PROCESSOR 3GHz  
(1MB L2 CACHE, 800MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL  
(LX.T6006.206)



- 2 x 1.0W integrated speakers
- VGA, DVI-D signal connectors
- 300 cd/m<sup>2</sup> brightness
- 12ms response time
- Silver color

**NEW!**

Acer AL1715smd  
**\$269**

17.0" LCD



#### Acer AL1715

- 17.0" TFT LCD
- 1280 x 1024 native resolution
- 500:1 contrast ratio
- 150° horizontal viewing angle
- 135° vertical viewing angle
- 2 x 1.0W integrated speakers on select models
- VGA signal connector
- 300 cd/m<sup>2</sup> brightness
- 12ms response time
- Black or beige color

Acer AL1715  
**\$249**

17.0" LCD

Prices shown are estimated street prices and do not include tax or shipping. Retailer or reseller prices may vary.

TEAM LinG - Live, Informative, Non-cost and Genuine!



## Acer® AcerPower™ FV Affordable Yet Feature-Rich



The **AcerPower FV** boasts an impressive feature set in a stylish chassis at a price that won't break your budget. Ample power means you can efficiently perform everyday tasks. Multiple expansion slots make the system easy to upgrade, while the six USB 2.0 ports (two front, four back) give you the ability to connect to the latest peripherals.

- Intel® Pentium® 4 Processor
- Microsoft® Windows® XP Professional
- 256MB DDR SDRAM
- 80GB¹ SATA hard drive
- CD-ROM drive
- 1.44MB¹ floppy drive
- Integrated Intel® Graphics Media Accelerator 900
- 10/100 LAN

Card reader shown is not included on featured model.

### AcerPower FV-U-P5150

**\$579**

INTEL® PENTIUM® 4 PROCESSOR 515  
(2.93GHz, 1MB L2 CACHE, 533MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL

## Acer® AcerPower™ F2b All-Around Budget Performer

Proven technology, high-level reliability and expansion options help to make the **AcerPower F2b** minitower a sound investment for home, school or office needs.

- Intel® Celeron® D Processor
- Microsoft® Windows® XP Professional
- 256MB DDR SDRAM
- 80GB¹ hard drive
- CD-ROM drive
- 1.44MB¹ floppy drive
- Intel® Extreme Graphics 2
- 10/100 LAN

### AcerPower F2b-U-C3500

**\$439**

INTEL® CELERON® D PROCESSOR 335  
(2.80GHz, 256KB L2 CACHE, 533MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL

**New charcoal-black chassis**



Card reader shown is not included on featured model.

## Compare Monitor Prices/Features & You'll Choose Acer



### Acer AL1511

- 15.0" TFT LCD
- 1024 x 768 native resolution
- 350:1 contrast ratio
- 140° horizontal viewing angle
- 125° vertical viewing angle
- VGA signal connector
- 250 cd/m² brightness
- 25ms response time
- Black or beige color

**\$40 PRICE CUT!**

### Acer AL1511

**\$189**

15.0" LCD

Prices shown are estimated street prices and do not include tax or shipping. Retailer or reseller prices may vary.

TEAM LinG - Live, Informative, Non-cost and Genuine!



Acer recommends Microsoft® Windows® XP Professional.



## **Acer® Veriton® 7600GT** *Business Productivity Tool - Minitower*

The **Acer Veriton 7600GT** minitower, with a deep-charcoal chassis, is a superb business productivity tool that includes a powerful processor, integrated graphics, management software and room for expansion. The one-touch recovery feature easily returns the PC to its original configuration.

- Intel® Pentium® 4 Processor with HT Technology
- Microsoft® Windows® XP Professional
- 512MB DDR400 SDRAM
- 80GB<sup>1</sup> hard drive
- CD-RW drive
- 1.44MB<sup>1</sup> floppy drive
- Intel® Extreme Graphics 2
- Gigabit LAN
- Three-year limited warranty<sup>2</sup>



**PRICE CUT!**

### **Acer Veriton 7600GT-U-P3201**

**\$839**

INTEL® PENTIUM® 4 PROCESSOR WITH HT TECHNOLOGY 3GHz  
(1MB L2 CACHE, 800MHz FSB)

MICROSOFT® WINDOWS® XP PROFESSIONAL

### **Acer Veriton 7600GT-U-P3001**

**\$799**

INTEL® PENTIUM® 4 PROCESSOR WITH HT TECHNOLOGY 3GHz  
(1MB L2 CACHE, 800MHz FSB)

MICROSOFT® WINDOWS® XP PROFESSIONAL

## **Acer® Veriton® 5600GT** *Business Productivity Tool - Standard Desktop*

The **Acer Veriton 5600GT** standard desktop offers the ultimate balance between space-saving design and expandability, all in a handsome deep-charcoal chassis.

- Intel® Pentium® 4 Processor with HT Technology
- Microsoft® Windows® XP Professional
- 512MB DDR400 SDRAM
- 80GB<sup>1</sup> hard drive
- CD-RW drive
- 1.44MB<sup>1</sup> floppy drive
- Intel® Extreme Graphics 2
- Gigabit LAN
- Three-year limited warranty<sup>2</sup>



**PRICE CUT!**

### **Acer Veriton 5600GT-U-P3201**

**\$839**

INTEL® PENTIUM® 4 PROCESSOR WITH HT TECHNOLOGY 3.20GHz  
(1MB L2 CACHE, 800MHz FSB)

MICROSOFT® WINDOWS® XP PROFESSIONAL

### **Acer Veriton 5600GT-U-P3001**

**\$799**

INTEL® PENTIUM® 4 PROCESSOR WITH HT TECHNOLOGY 3GHz  
(1MB L2 CACHE, 800MHz FSB)

MICROSOFT® WINDOWS® XP PROFESSIONAL



### **Acer AC711**

- 17.0" CRT
- 16.1" diagonal viewing area
- 1024 x 768 @ 85Hz recommended resolution
- 0.27mm dot pitch
- Black or beige color

### **Acer AC711**

**\$109**

17.0" CRT  
(16.1" VIEWABLE)

**GREAT VALUE!**

**acer**  
Empowering People

Prices shown are estimated street prices and do not include tax or shipping. Retailer or reseller prices may vary.

**TEAM LinG - Live, Informative, Non-cost and Genuine!**



## Acer® TravelMate® 4500 All-Around Business System

Suitable for both office and on-the-go use, the **Acer TravelMate 4500** strikes just the right balance between performance and mobility. Connect to workplace peripherals in one easy step with the optional EasyPort Port Replicator III. On the road, expect up to five hours of battery life (depending on configuration and usage) from this 6.5-pound notebook. And should you want to cut the weight, the modular optical drive is easily removed.



**MOBILE  
TECHNOLOGY**

**Acer recommends Microsoft® Windows® XP Professional.**

**Up to 1GB memory and  
100GB<sup>1</sup> hard drive**



- Intel® Centrino™ Mobile Technology
  - Intel® Pentium® M Processor
  - Intel® 855GME chipset
  - Intel® PRO/Wireless 2200BG network connection
- Microsoft® Windows® XP Professional
- Modular DVD-Dual drive (DVD+/-RW)
- 15.0" XGA (1024 x 768) TFT display
- Intel® 855GME chipset with integrated graphics
- 802.11b/g WLAN, 10/100 LAN, V.92 modem
- One-year limited warranty<sup>2</sup>

### Acer TravelMate 4504LMi

**\$1,499**

INTEL® PENTIUM® M PROCESSOR 745  
(1.80GHz, 2MB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL  
1GB DDR333 SDRAM AND 100GB<sup>1</sup> HARD DRIVE  
(LX.T5106.112)

### Acer TravelMate 4502LMi

**\$1,199**

INTEL® PENTIUM® M PROCESSOR 725  
(1.60GHz, 2MB L2 CACHE, 400MHz FSB)  
MICROSOFT® WINDOWS® XP PROFESSIONAL  
512MB DDR333 SDRAM AND 80GB<sup>1</sup> HARD DRIVE  
(LX.T5106.109)

## Acer Notebook/Tablet Service Upgrades Protect Your Valuable Investment

Quality is built into every notebook and Tablet PC Acer makes, and each comes with a one-year standard limited warranty.<sup>2</sup> It includes 24/7 (excluding some holidays) hardware technical support via toll-free phone plus a concurrent International Traveler's Warranty for travel outside the U.S. and Canada. Extra protection is available with one of these upgrades:

2-Year Extension of Limited Warranty (146.AB820.EX2)

**\$99**

Prepays freight to and from Acer repair depot.  
Excludes extension of International Traveler's Warranty.

2-Year Extension of Limited Warranty + 3-Year Total Protection Upgrade (146.AD077.002)

**\$199**

Prepays freight to and from Acer repair depot.  
Excludes Extension of International Traveler's Warranty.

<sup>1</sup> When referring to storage capacity, GB stands for one billion bytes and MB stands for one million bytes. Some utilities may indicate varying storage capacities. Total user-accessible capacity may vary depending on operating environments.

<sup>2</sup> For a free copy of the standard limited warranty end-users should see a reseller where Acer products are sold or write to Acer America Corporation, Warranty Department, P.O. Box 6137, Temple, TX 76503.

For the name of a reseller near you or further information, please call Acer or visit our Web site:

**800-571-2237**

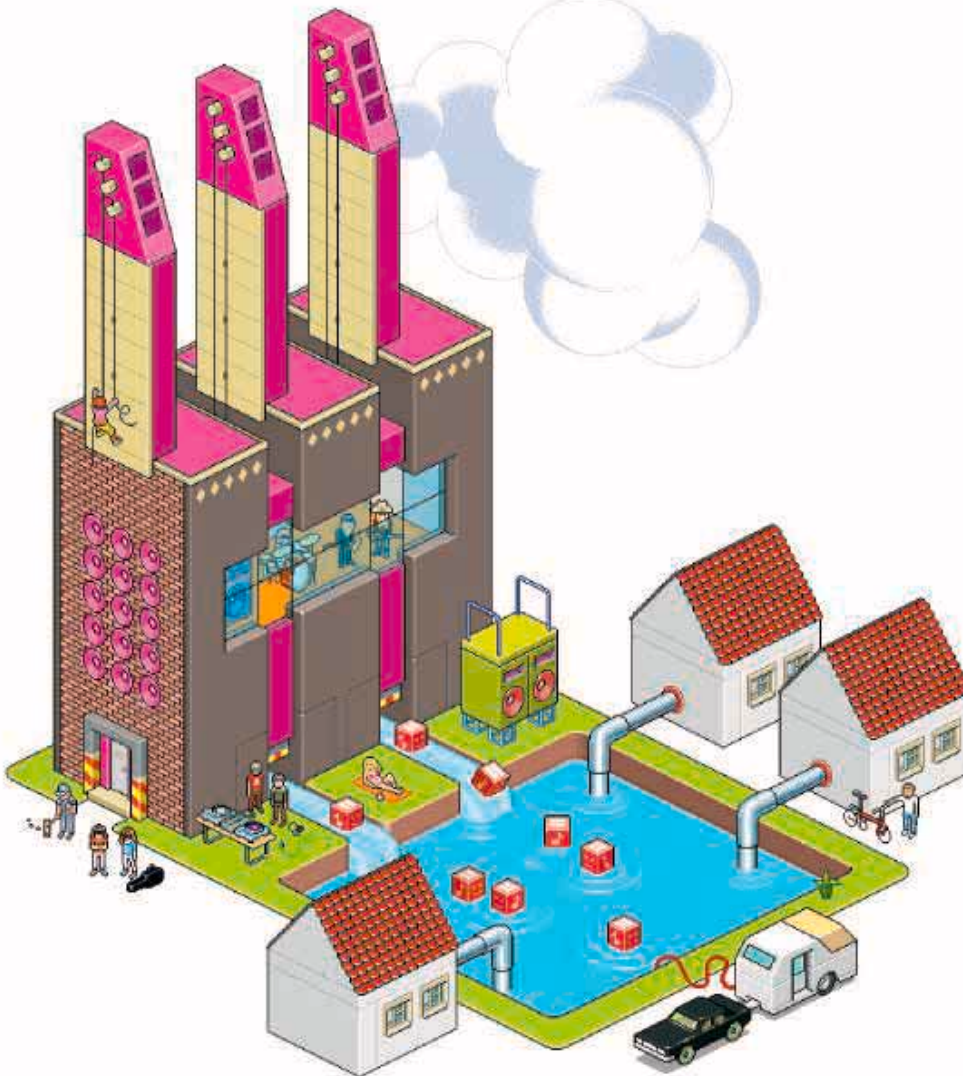
**www.acer.com/us**

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Prices shown are estimated street prices and do not include tax or shipping. Retailer or reseller prices may vary.

**TEAM LinG - Live, Informative, Non-cost and Genuine!**





The new world of personal tech—for the living room and beyond

## NEXT GEAR

EDITED BY ANDREW BRANDT

## MUSIC UNLIMITED

**SUBSCRIPTION SERVICES GIVE YOU LEGAL ACCESS TO THE LARGEST MUSIC COLLECTIONS ON THE PLANET. AND NEW OPTIONS ARE MAKING THEM MORE TEMPTING. BY ERIC HELLWEG**

FOR DIGITAL MUSIC lovers, there's another option besides outright purchase and outright theft. Subscription-based services permit music fans, for a fee of less than \$10 per month, to rent all the digital tunes they could want.

With all the new choices in services—including ones operated by Musicmatch, Nap-

ster, Real, and Virgin—we decided to evaluate them more closely. Each service lets you access its entire music library at any time, as if it were a gigantic jukebox. In many instances, the songs stream to your PC as you listen, so you don't have to download an entire song before playing it.

Many people listen to music

on the go, so you might think that streaming is sometimes less desirable than downloading. After all, you can listen to streaming music only while at or near a PC with an Internet connection. To deal with this limitation, some services give their customers the option of downloading songs to their PC's hard drive for later use.

These downloadable tracks differ in important and basic ways from what you get if you buy them outright. The downloads from subscription services incorporate digital rights management (or DRM) technology to limit what you can do with your music. For instance, a DRM-protected song may be set up to prevent ►

you from burning it to a CD; in contrast, a typical track purchased from the iTunes Music Store (for example) carries no such restrictions.

On some music services, downloadable files are just a convenience. On others (such as Virgin Digital), the service may not always let you stream an entire song; in those cases, you'll have to download the protected files if you want to hear the song in its entirety.

DRM permits music rental services to expire songs when a customer's subscription lapses. Until recently, this ability to control the way you used a song was possible only on a desktop PC. But a new DRM technology, called Janus, will be able to untether these restricted files from a PC so you can play them on portable music players. (For more information, see "Can You Take It With You?" on page 121.) To play music encapsulated in Janus DRM, you must have a new, Janus-compatible player.

### SELECTION IS KEY

THE BIGGEST ADVANTAGE of streaming music is the selection. If you prefer an unlimited

musical buffet to à la carte paid downloads, it's hard to beat streaming services. Each competing service provides hundreds of thousands of tracks that subscribers can play almost instantaneously.

Despite promises of huge

agreements in order to do different things with the music; a service that has a license to sell a song might not be able to stream it, for example.

Consider Neil Young's early seven-track album *Everybody*

a service would let you stream the entire song or download a DRM-encased version of any track available in its library. And the library shouldn't have maddening gaps in the playlists of popular artists.

Though such discrepancies don't nullify the value that these music services provide, prospective subscribers should be aware of them. A service with 800,000 streamed songs in its database might not have the very one you want to hear.



**SEARCHING NAPSTER by song title or artist delivers a lot of results, but other search options turn out to be frustratingly limited.**

numbers of songs available on the various services, odd catalog omissions crop up on occasion. Representatives from several of the companies say that holes in a service's library might reflect the lack of a license to present songs or albums in a particular format. Each record company requires services to sign unique license

*Knows This Is Nowhere*. When we checked, Napster and Virgin Digital had all seven songs on the album available for download, but only Napster let us stream every track in its entirety (Virgin limited us to playing a 30-second streamed preview). Rhapsody offered only six of the album's songs and Musicmatch four. Ideally,

### Musicmatch On Demand ★★★★★

THE CLEAN AND uncluttered interface of Musicmatch On Demand integrates with its Jukebox player, which makes navigating through albums and single tracks easy.

Once you've added the On Demand service to Jukebox, you can drag and drop songs from a search panel into Jukebox's playlist window. One useful option lets you create playlists that mix and match tracks on your hard drive with streaming tracks.

If you're in a musical rut, Musicmatch can recommend

## FEATURES COMPARISON

### RHAPSODY DELIVERS STREAMING MUSIC NIRVANA

FEATURES SUCH AS blogging and playlist browsing set the Rhapsody service (and its player software) ahead of the competition.

SERVICE	Price	Selection <sup>1</sup>	Sound quality	Free trial period	Extra features
Musicmatch On Demand (★★★★★) <a href="http://www.musicmatch.com">www.musicmatch.com</a>	\$9.95 per month <sup>2</sup>	Over 800,000 songs	Good	7 days	E-mail your playlists to anyone; Music Discovery Engine makes good guesses about music you'll like.
Napster (★★★★★) <a href="http://www.napster.com">www.napster.com</a>	\$9.95 per month	Over 700,000 songs	Fair	7 days	Peek into other members' playlists or share your own; see what other members are playing in real time; communicate via message boards.
<b>Best Buy</b> Rhapsody (★★★★★) <a href="http://www.real.com/rhapsody">www.real.com/rhapsody</a>	\$9.95 per month <sup>3</sup>	Over 800,000 songs	Good	14 days	Blog your playlists and comment on others'; share your playlist or browse and listen to others' playlists; e-mail your playlists to anyone.
Virgin Digital (★★★★★) <a href="http://www.virgindigital.com">www.virgindigital.com</a>	\$7.99 per month	Over 1,000,000 songs	Good	14 days	Stream most of the library or download protected files; some songs are download-only and cost a dollar each beyond subscription fees.

**FOOTNOTES:** <sup>1</sup> The stated size of the music library is provided by the vendor and could not be independently verified. <sup>2</sup> The service costs \$9.95 per month if billed monthly; \$8.95 if you pay in 3-month, \$26.85 blocks; and \$7.95 per month if you pay for 12 months at once (\$95.40 total). <sup>3</sup> \$8.32 per month if you pay in 3-month, \$24.95 blocks.



new tunes: Select ten bands or artists you like (or let Jukebox inventory the music files on your PC), and the Music Discovery Engine will volunteer dozens of recommendations based on cues from the music-listening habits of all its users.

## Napster

★★★★★

THE FIRST TIME around, watching the Napster client locate music is as thrilling as it was when Napster was an illicit service. But the thrill departs quickly. Of the services we tested, Napster's ultimately disappointed us the most.

The client's cluttered and inconsistent interface makes it hard to tell, for instance, whether you'll hear the full song or just a 30-second sample when you click a title.

Napster touts its ability to search and play other members' playlists, but the interface has too few options: You can search only by the overly broad "genre" categories; or you can browse other users' playlists—if you know their name. But unless you figure out by ESP that "pookie2783" shares your tastes in music, this feature is pretty useless.

Most annoying was the pause—a result of the service's buffering the stream—that ensued after we clicked a song title. We had to wait several seconds for some songs to play. All in all, Napster reborn is only a shadow of its former self.

## Rhapsody

★★★★★

**Best BUY** WITH OVER 800,000 songs to choose from, clear organization, and links to a wide range of bonus content (including music videos),

## SUBSCRIPTION PORTABILITY

# CAN YOU TAKE IT WITH YOU?

THANKS MOSTLY to a Microsoft-developed technology called Janus, you will soon be able to drag and drop any number of your favorite songs from a subscription service to a portable player. Your music will no longer be trapped in that boat anchor of a PC of yours, chaining your tunes to your desk.

Not all services plan to use Janus, however. Most notably, Microsoft competitor Real Networks intends to go its own way, promising to release its own home-brewed flavor of some kind of device portability in 2005. For their part, Musichatch and Virgin Digital each expect to unveil Janus-based portability options this year. (For more about these new services, head to [find.pcworld.com/46562](http://find.pcworld.com/46562).)

Only one service, the FYE Download Zone, offers a final version of a Janus-based portability program. Napster's "preview" release of its own client software can't transfer songs to a Janus-compatible portable player—users must do that through Windows Media Player.



Both FYE and Napster charge \$14.95 per month for Janus downloads, compared with \$9.95 per month for a standard subscription. But for that extra \$5 per month, you get to carry an amount of music that is limited only by the storage capacity of your portable player. Theoretically, with a big enough player, you

could tote 800,000 songs wherever you go. The only tether is a monthly check-in, during which you dock your portable player to an Internet-enabled computer and permit the service to renew the licenses. If you cancel your subscription to the music service or let it lapse, you won't be stuck with unplayable songs: They delete themselves from the player.

For the moment, the biggest problem is finding an audio player that supports Janus. At press time, only five players offered Janus support, but that number is expected to grow considerably in early 2005, when manufacturers start shipping new models.

Rhapsody fared the best of the four services we tested. It isn't the cheapest service (Musichatch offers subscriptions at rates as low as \$7.95 per month, if you commit to a full year of service); but its

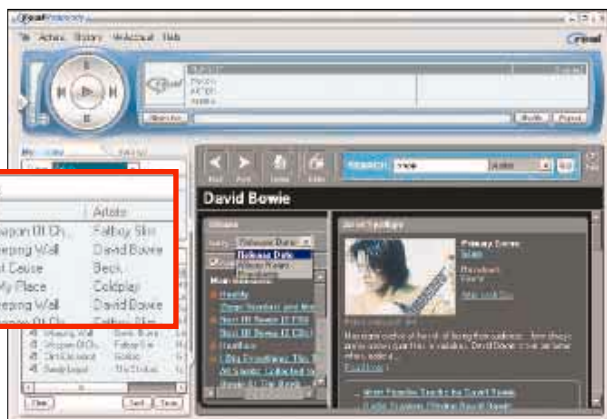
sound quality is excellent, it offers desirable bonus features, and we didn't encounter any major faults.

Despite its association with Real, Rhapsody doesn't require its subscribers to use

Real's RealPlayer application. Instead, subscribers simply download the Rhapsody player, whose elegant user interface we prefer to RealPlayer's.

Unlike some of the other services, Rhapsody introduces remarkably little lag between the time when you click the play button and the time when the song starts to play. Rhapsody's responsiveness makes the experience of listening to streaming music about as close as you can get to playing a song file that's on your PC's hard drive.

Rhapsody offers other innovative features for subscribers, too. Music fanatics can use the application's blog link to share playlists and to post comments about them. ►



**FETCH AND ORGANIZE** your streamed and downloaded songs the way you like, using Rhapsody's flexible user interface.

★★★★★

The downloaded music that you get as part of the subscription comes in Windows Media



Some of the music in Vir-

*Eric Hellweg is a writer based in Cambridge, Massachusetts.*

# RADIO FREE INTERNET

mercora

open my mercora

amshabbat

My Friends

love to my friends

radio folk

chillies (hands)

paster2112

DOHNUS

drabeo

i-o

New Friends

I'm Available

them to a favorites list. But unlike the early Napster, Mercora needs more people (and their music) to populate the service. Both Mercora and Shoutcast offer a viable alternative to fee-based streaming services. Unfortunately, even though you can tune in to dozens of different genres of music, Mercora and Shoutcast have the same drawback as radio: You can't pick the song you want to hear.



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# GADGET FREAK

DAN TYNAN

## TV, MICROSOFT STYLE



REMEMBER MICROSOFT and Intel's "Digital Joy" ad campaign, which touted Windows Media Center PCs as the perfect holiday gift? Well, if that's joy, I'll take heartbreak.

Personally, I would rather be trapped in a bomb shelter with Donald Trump than plant an ugly, noisy Windows machine in my living room (see "Keep the PC—I'll Take TiVo," March 2004, [find.pcworld.com/46492](http://find.pcworld.com/46492)). But over the past year, Microsoft has spiffed up Media Center—the OS can now stream live TV, recorded shows, music, and pictures from a PC to your home entertainment gear via a third-party set-top box. And companies like Creative and IRiver have come out with portable players that let you carry around your favorite TV shows (provided you record them on a Media Center PC).

So I decided to give Windows another shot at my living room. I got my hands on a

Dell Dimension 8400 Media Center PC (\$3200, [www.dell.com](http://www.dell.com)), which comes bundled with a Linksys A+G Wireless router (\$100 to \$150 separately, [www.linksys.com](http://www.linksys.com)) and a Linksys Media Extender (\$250 to \$300) to stream content across a wireless network. And then I held my breath.

### KILLER INSTALL

SETTING UP THE system was joy incarnate. All I had to do was tear out my old Wi-Fi network and install an 802.11a/g one using the Linksys router, reconfigure my cable splitter, troubleshoot a half-dozen niggling problems (including a faulty system fan that sounded like a Cessna revving for take-off), and act as marriage counselor between the Dell and the Linksys Extender, which disagreed about everything.

Three days later I got it all working, sort of. I could play music and view photos on my TV, but the video stream still

skipped frames occasionally or went blank, and there was a lag when I changed channels. When Bill Gates touts "seamless computing," I doubt this is what he has in mind.

Another hitch: When I attempted to watch a Disney film on HBO, I got a screen declaring the Extender was unable to play back "restricted content" (probably the only time *The Mighty Ducks* has ever earned that sobriquet). Dell says the problem affects only HBO, and a patch should be available by the time you read this.

Managing digital content on a computer makes sense, the Dell system is otherwise pretty slick, and the Windows Media Center interface isn't half bad. But I like my household appliances to work when I plug them in, not after three days of troubleshooting. Spending thousands on a Windows Media Center 2005 PC is silly when there are cheaper, easier alternatives, like set-top boxes with DVR functions or the simple-as-pie Prismiq MediaPlayer. (A MediaPlayer with DVR capability should be available in mid-2005.)

The real problem is that Gates & Co. want to own the software that runs the networked homes of the future. They won't stop at your living room—they want your garage,

### NEXT UP

#### Stuff With Storage



WANT TO ADD more storage to your home network and distribute your digital media? With ADS's \$200 NAS Drive Kit ([www.adstech.com](http://www.adstech.com)), you can—once you add an IDE hard drive (not included). You insert the drive into the kit, and it connects to your network via ethernet or wireless 802.11g. It can store and serve your data, and send your digital media for playback on your PC or on any network-connected A/V device with Universal Plug and Play. Two USB ports let you add peripherals to the unit. It autosenses the network so you don't have to mess with IP addresses. Included software helps you manage your content and get video or music from the Internet.

your kitchen, and your bathroom, too. I keep having nightmares where I can't cook dinner because My Microwave won't work until I upgrade the firmware on My Toilet.

Until these things work as seamlessly as my stereo or my TV, I don't want them running my house. Microsoft may yet conquer the living room and more, but it'll do so the way it always has—with marketing muscle and bullying tactics, not necessarily with superior products.

Joy? Not in my world. ■

*Contributing Editor Dan Tynan dreams of a Windows-free world.*

ILLUSTRATION: TIM BOWER





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\* Does not copy DVDs with copy protection.

December 13, 2004  
Nero 6 Ultra Edition 6.6

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# TOP 100

EDITED BY THE REVIEWS STAFF

## SPOTLIGHT: HARD DRIVES



**SPACIOUS HARD DRIVES:**  
Though Serial ATA drives are  
picking up steam, Parallel ATA  
drives retain a price advantage.

## Give Your Storage a Boost

Lower costs and higher capacity make hard drives a great bargain right now.

FUNNY HOW YOUR once-ample hard drive seems to be awfully crowded lately. Maybe it's all those images from your digital camera. Or perhaps you've been downloading too many albums from the iTunes store. Another potential culprit is the slew of home videos that you might have digitized for a DVD montage.

Fortunately, it's a fine time to add a

massive new hard drive to your system. The average price per gigabyte is at an all-time low—just under a buck for the typical Serial ATA interface model, and about 75 cents for tested models that use the earlier but still very common Parallel ATA interface. Whether you want to swap out your old drive for a new 400GB behemoth, or you're ready to make your

existing drive part of a two-drive RAID configuration for better speed or for redundancy, we've found a model for you.

The PC World Test Center tested units from all five major manufacturers of hard drives: Hitachi, Maxtor, Samsung, Seagate, and Western Digital. We ran seven SATA drives and six PATA drives through a suite of tests designed to compare write

PHOTOGRAPHS: MARC SIMON



### 133 DESKTOP PCs

Our Best Buy system from Gateway is one of two value PC newcomers that each come configured with a king-size hard drive—200GB, to be exact.

### 135 NOTEBOOK PCs

Three new laptops find spots on our chart this month, including a desktop replacement from Chem USA and a low-cost ultraportable from WinBook.

### 137 MONITORS

We tested a slew of new 17-inch LCD monitors this month—and found a new number one model from Eizo, and Best Buys from Dell and Sharp.

### 139 SCANNERS

New models from Epson and Canon earn Best Buy honors—and first-place rankings—in our small-office and corporate categories, respectively.

### 141 MORE REVIEWS

Advanced digital cameras, color laser printers, and rewritable DVD drives headline our recap of products that made the *Top 100* charts in previous months.



speeds and seek times. Then we examined each drive's retail bundle as a whole to determine which package provided the best overall value for the money.

#### SATA-IATED

SATA HARD DRIVES arrived on the scene about two years ago, but they're becoming the mainstream drive of choice only now. The lag was not wholly unexpected: Since most motherboards supported only the Parallel ATA interface at the time SATA drives debuted, early SATA adopters had to buy PCI adapter cards. Today, however, most new motherboards offer integrated SATA connections (as well as legacy PATA connectors); and market research firm IDC expects SATA drive shipments to outstrip PATA by mid-2005.

SATA's refined design represents a step up. PATA ribbon cables are wide and impede air flow; SATA cables are easier to attach and significantly less bulky. SATA drives are simpler to connect and configure, too, with no master/slave jumpers to set. And finally, SATA offers greater bandwidth. Its maximum transfer rate of 150 megabytes per second is an improvement on PATA's maximum rate of 133 MBps. The transfer-rate headroom may not translate into extraordinary performance gains in single-drive systems, but it can pay off nicely in multidrive and RAID setups in which several drives access the data bus simultaneously.

#### AFTER SATA

DRIVE VENDORS ARE already looking beyond the original SATA specification. The next evolution of SATA doubles SATA's peak transfer rate to 300 MBps. Another new feature is native command queuing (NCQ), which enables a drive to store and

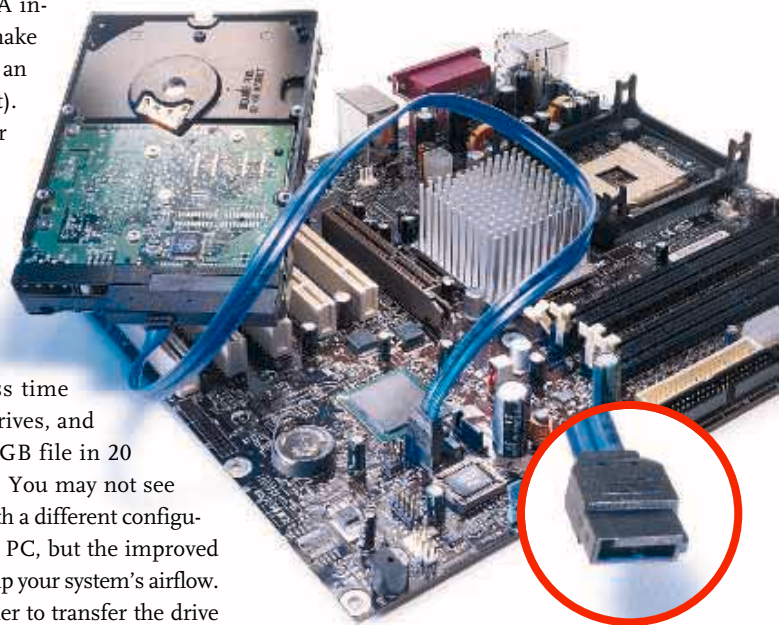
execute commands independently in the most efficient order possible. Of the 13 drives we tested, only the models from Maxtor and Seagate support NCQ.

Whether you're upgrading your hard drive or buying one for a system you're building from scratch, you'll need to make a number of decisions. First, decide which interface you want. If you have an older PATA system, you might still consider buying a SATA drive, along with an inexpensive SATA interface card (but make sure that you have an available PCI slot). In our Test Center appraisals, SATA drives did better than their PATA rivals. On average, the SATA group copied files and folders in 17 percent less time than the PATA drives, and copied a single 3GB file in 20 percent less time. You may not see the same gains with a different configuration or an older PC, but the improved cabling can still help your system's airflow. And it will be easier to transfer the drive you get today to the next PC you buy.

Other buying criteria include capacity, price, rotational speed, and buffer size. Capacity needs are very user-dependent; but graphics, music, and video mavens should go for the biggest size they can afford, since media files eat up hard-drive real estate in a hurry. At current prices, 250GB drives are the most economical—about 68 cents per gigabyte. But newer, 400GB drives are priced just 7 cents higher per gigabyte, making them suitable as

a hedge against future storage needs.

The great majority of mainstream hard drives spin their platters at 7200 rpm. You should avoid the increasingly rare 5400-rpm drives if performance is a primary consideration. Only one manufacturer—Western Digital—today makes a 10,000-rpm ATA drive. The company's 74GB Raptor WD740GD uses the SATA interface; it was designed for use in enterprise RAID configurations. It's no slouch in a



**BYE-BYE, BULKY CABLES:** Serial ATA's cabling is slimmer than IDE's and can help the flow of air in the system. Inset: Western Digital's strengthened SATA connector.

desktop RAID 0 setup, either: When we paired Raptors in a RAID configuration, we got outstanding performance (see "Hard Drives Gain Racing Stripes" on page 129)—even though the Raptor lagged slightly behind the average SATA ►

drive in some of our single-drive tests. Because of its relatively small capacity and high performance in arrays, the Raptor is often configured in RAID arrangements in high-end desktops and servers. Gamers and video editors, in particular, can benefit from this type of setup.

Though buffer size is a basic drive spec, assessing the merits of different buffer sizes is difficult. The PC World Test Center's evaluation of these drives didn't reveal any direct correlation between buffer size and improved speed: In both the

PATA and the SATA categories, the fastest drives used 8MB buffers, while several runners-up employed 16MB buffers.

### PASS THE SCREWDRIVER

OF THE DRIVES we tested for this round-up, all but one (Samsung's SP1604N) are sold as boxed drive kits. If you buy the full retail kit instead of a bare drive, you'll get a few extras you may need. Typically, retail kits come with mounting screws, cables and connectors, diagnostic and setup software, and installation instructions.

Installation software accompanied most of the drives we tested, but the majority of the included apps are redundant in light of Windows XP's integrated tools for installing, partitioning, and formatting a drive. Maxtor, Seagate, and Western Digital provide DOS formatting utilities, too.

All of the kits offer usable instructions on paper. Seagate and Western Digital supply quick-install setup posters, while Maxtor includes an installation booklet; Seagate's CD-ROM comes with an installation video, too. Hitachi's installation

## TOP 100

### TEST Center

## Monster-Size Storage

ANY OF THESE TEN HARD DRIVES can expand your storage capacity, but only Seagate's drives come with backup software.

SERIAL ATA HARD DRIVE		Features and specifications		Performance	Bottom line
1	Seagate Barracuda 7200.8 ST3400832AS <b>\$350 (★★★★★)</b> <a href="http://find.pcworld.com/46340">find.pcworld.com/46340</a>	• 400GB • 7200 rpm • Serial ATA-150	• 8MB buffer • Cable, DiscWizard software • Cost per gigabyte: \$0.93	Overall performance: Very Good Copy files (3.1GB): 156 seconds Find files (12.6GB): 133 seconds	Capacious hard drive shone on our copy files test. Includes CMS's BounceBack Express backup software.
2	Western Digital Raptor WD740GD <b>\$200 (★★★★★)</b> <a href="http://find.pcworld.com/46348">find.pcworld.com/46348</a>	• 74GB • 10,000 rpm • Serial ATA-150	• 8MB buffer • Cable, Data LifeGuard software • Cost per gigabyte: \$2.70	Overall performance: Very Good Copy files (3.1GB): 202 seconds Find files (12.6GB): 119 seconds	This pricey drive offers raw speed in a RAID configuration, in which performance can jump by up to 33 percent.
3	Western Digital Caviar SE WD2500JD <b>\$200 (★★★★★)</b> <a href="http://find.pcworld.com/46350">find.pcworld.com/46350</a>	• 250GB • 7200 rpm • Serial ATA-150	• 8MB buffer • Cable, Data LifeGuard software • Cost per gigabyte: \$0.80	Overall performance: Very Good Copy files (3.1GB): 184 seconds Find files (12.6GB): 134 seconds	Reasonably priced drive uses more-robust SATA connectors than those found on competing drives.
4	Maxtor DiamondMax 10 6B300S0 <b>Best BUY \$230 (★★★★★)</b> <a href="http://find.pcworld.com/46358">find.pcworld.com/46358</a>	• 300GB • 7200 rpm • Serial ATA-150	• 16MB buffer • Cable, MaxBlast software • Cost per gigabyte: \$0.77	Overall performance: Very Good Copy files (3.1GB): 178 seconds Find files (12.6GB): 143 seconds	Bargain-priced SATA drive offers high performance and plenty of storage capacity for the price.
5	Maxtor DiamondMax 10 6B250S0 <b>\$220 (★★★★★)</b> <a href="http://find.pcworld.com/46360">find.pcworld.com/46360</a>	• 250GB • 7200 rpm • Serial ATA-150	• 16MB buffer • Cable, MaxBlast software • Cost per gigabyte: \$0.88	Overall performance: Very Good Copy files (3.1GB): 177 seconds Find files (12.6GB): 135 seconds	Model provides strong performance; for \$50 more, however, you can buy the 300GB version of the drive.
PARALLEL ATA HARD DRIVE					
1	Seagate Barracuda 7200.8 <b>\$285 (★★★★★)</b> <a href="http://find.pcworld.com/46342">find.pcworld.com/46342</a>	• 400GB • 7200 rpm • Parallel ATA-100	• 8MB buffer • Cable, DiscWizard software • Cost per gigabyte: \$0.71	Overall performance: Good Copy files (3.1GB): 210 seconds Find files (12.6GB): 132 seconds	Low cost per gigabyte makes this massive drive a terrific bet for digital pack rats who need lots of storage.
2	Seagate Barracuda 7200.8 <b>Best BUY \$170 (★★★★★)</b> <a href="http://find.pcworld.com/46344">find.pcworld.com/46344</a>	• 250GB • 7200 rpm • Parallel ATA-100	• 8MB buffer • Cable, DiscWizard software • Cost per gigabyte: \$0.68	Overall performance: Good Copy files (3.1GB): 216 seconds Find files (12.6GB): 135 seconds	Like the other Seagate models on the chart, this low-cost drive includes CMS's backup software and a five-year warranty.
3	Western Digital Caviar SE WD2500JB <b>\$180 (★★★★★)</b> <a href="http://find.pcworld.com/46352">find.pcworld.com/46352</a>	• 250GB • 7200 rpm • Parallel ATA-100	• 8MB buffer • Cable, Data LifeGuard software • Cost per gigabyte: \$0.72	Overall performance: Good Copy files (3.1GB): 199 seconds Find files (12.6GB): 133 seconds	By a slim margin, this attractively priced drive was the speediest PATA model on the chart on our copy files test.
4	Maxtor DiamondMax 10 6B250R0 <b>\$180 (★★★★★)</b> <a href="http://find.pcworld.com/46356">find.pcworld.com/46356</a>	• 250GB • 7200 rpm • Parallel ATA-133	• 16MB buffer • Cable, MaxBlast software • Cost per gigabyte: \$0.72	Overall performance: Good Copy files (3.1GB): 224 seconds Find files (12.6GB): 142 seconds	On our large-file copy test, this model's performance bested the 400GB Seagate's by 25 percent.
5	Maxtor DiamondMax 10 6B200P0 <b>\$160 (★★★★★)</b> <a href="http://find.pcworld.com/46354">find.pcworld.com/46354</a>	• 200GB • 7200 rpm • Parallel ATA-133	• 8MB buffer • Cable, MaxBlast software • Cost per gigabyte: \$0.80	Overall performance: Good Copy files (3.1GB): 236 seconds Find files (12.6GB): 148 seconds	Like its 250GB sibling, this drive lagged a bit behind the competition on several tests: find files, Nero, and ACDSee.

**HOW WE TEST:** To test performance, we copy a 3.1GB folder and a large 3.1GB .zip file to the Windows Desktop, scan a 6.2GB folder with McAfee VirusScan 8, search through 12.2GB of files on the drive for a text string, time how long the drive takes to perform several tasks in ACD Systems' ACDSee PowerPack 5.01, create CD-ROM images with Nero Burning ROM 5.5.7.6, and time how long the drive takes to compress files with WinZip 8.1. **CHART NOTES:** See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings. See [find.pcworld.com/46530](http://find.pcworld.com/46530) for further test results.



guide is available on its Web site—an adequate arrangement if you have access to the Internet prior to installing the drive.

One difference we observed among the drives: The SATA connectors on Western Digital's SATA drives are noticeably bigger and sturdier than those on competing models. While still meeting the SATA standard, the connectors are a bit wider and have two additional male/female friction points on the outside for more-secure fastening. Also, Seagate includes backup software with its drives: CMS's useful (though inelegant) BounceBack Express.

### BIG, SPEEDY DRIVES

FOR THIS ROUNDUP we corralled six PATA drives: two versions (200GB and 250GB) of Maxtor's DiamondMax 10, Samsung's 160GB SP1604N, two Seagate Barracuda 7200.8 models (250GB and 400GB), and Western Digital's 250GB Caviar SE WD2500JB. On the SATA side, we tested Hitachi Global Storage's 250GB Deskstar 7K250 and 400GB Deskstar 7K400, Maxtor's 250GB and 300GB DiamondMax 10 units, Seagate's 400GB Barracuda 7200.8, and Western Digital's 74GB Raptor WD740GD and 250GB Caviar SE WD2500JD. The WD740GD is a 10,000-rpm drive; all of the others spin at 7200 rpm. Our Test Center evaluated all drives individually (see the sidebar at right for information about tests conducted on two drives in a RAID 0 array).

In our benchmark configuration for single drives, the SATA models tended to be impressive performers. In our time trials for transferring 3GB of files and folders, top honors went to Seagate's 400GB Barracuda 7200.8. Maxtor's 250GB and 300GB DiamondMax 10 models were runners-up, just over 20 seconds (about 12 percent) off the pace set by the Barracuda. In fourth, a few seconds behind the Maxtor drives, was Western Digital's 250GB Caviar SE WD2500JD, followed by Hitachi's 250GB Deskstar 7K250, Western Digital's Raptor WD740GD, and Hitachi's 400GB Deskstar 7K400.

In the PATA ranks, Western Digital's Caviar SE WD2500JB led the pack on our file-and-folder test, followed closely by Seagate's 400GB and 250GB Barracuda

## RAID

# Hard Drives Gain Racing Stripes

### STRIPES ARE COOL.

Zebras confuse predators with them, and the Beach Boys made millions wearing them. But they're also very handy when it comes to hard drives. RAID (Redundant Array of Independent Disks) comes in a variety of flavors. The one that is most commonly used with desktop systems, RAID Level 0, isn't

really a type of RAID at all (thus, RAID "0") because it doesn't provide any redundancy.

RAID 0 stripes (or parcels out) data across multiple drives to create one larger logical drive, delivering much faster sustained reads and writes along with sometimes slightly slower random access. An analogy would be to have multiple waiters instead of one serving dinner to your table: It takes a while longer to organize things; but then the food and drink (or data, in this case) flow to you much faster.

Another advantage of RAID 0 is relatively low cost. Drive vendors charge a hefty premium for their largest models, so you can achieve a better cost per gigabyte by combining multiple smaller-capacity drives. Today, a single 400GB drive costs about \$350, whereas two 200GB units combined into a single 400GB logical drive cost about \$250, plus \$20 to \$50 for a RAID controller card if you need one.

Most mainstream add-in RAID cards and motherboards also support RAID Level 1 (mirroring), which writes the same data to two drives at once for data redundancy in



case one of the drives fails. In addition, some cards let you combine RAID 0 and RAID 1 (RAID 0+1) so you can mirror a pair of striped drives (if you have four drives).

The Raptor WD740GD posted the fastest or the second-fastest time on every RAID 0 test. Its biggest gains came on our large-file and file-and-folder tests, with jumps of 32 percent and 43 percent over a stand-alone Raptor. This RAID setup also outperformed the average single SATA drive in some—but not all—of our tests (see [find.pcworld.com/46530](http://find.pcworld.com/46530) for more details).

You don't have to graduate to a 10,000-rpm drive to see performance improvements with RAID, though. When configured using RAID 0, Western Digital's SATA Caviar SE WD2500JD improved its times by 26 percent and 33 percent, respectively, on our large-file and file-and-folder tests.

Given the sizable boosts we saw in our tests, we'd recommend a RAID setup to anyone seeking optimum PC performance. Just be sure to back up regularly: The big disadvantage of RAID 0 is that if one drive goes bad, you lose the data on both.

drives. A greater gap separated the Caviar SE from the fourth- and fifth-place finishers: Maxtor's 250GB and 200GB DiamondMax 10 drives. Samsung's SP1604N, which finished dead last in performance and missed our chart, trailed the number one Seagate Barracuda by 20 percent.

Given how close our test results were, all of these drives are easy to endorse. That said, we advise you to get SATA—

even if that entails buying an affordable PCI controller card. Select a high-capacity, money-is-no-object SATA drive (like our chart topper, Seagate's 400GB Barracuda), or balance price and capacity with Maxtor's DiamondMax 10 6B300S0. For optimum desktop performance, a RAID 0 array with multiple Western Digital Raptor WD740GD drives is a sure but pricey bet.

—Jon L. Jacobi

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# IN THE CHARTS

EDITED BY THE REVIEWS STAFF

## Fast Computers Offer Massive Hard Drives for a Bargain Price

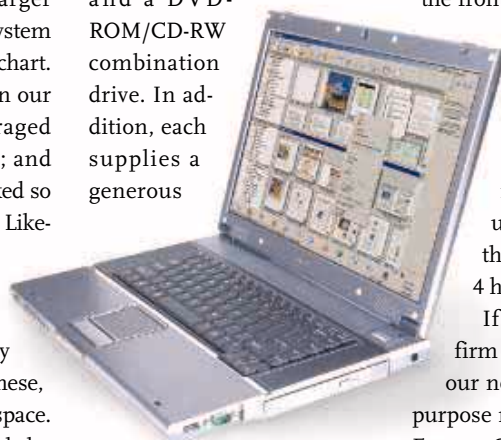
THE TWO NEWCOMERS to this month's *Top 15 Desktop PCs* chart are well-designed systems that provide a huge amount of hard-drive space for a low price. The Gateway 5200XL and the Velocity Micro ProMagix PCX each have a 200GB hard drive—larger than that of any other system on the value side of the chart. A year ago, value PCs on our March 2004 chart averaged half as many gigabytes; and only power systems packed so much storage real estate. Likewise, today's power models are upping their capacity; the HP Media Center PC M1050y rates as the roomiest of these, with 400GB of available space.

Both the Gateway and the Velocity Micro earned high marks in our WorldBench 5 test suite. The ProMagix PCX scored 94, higher than any other value desktop on the chart. The 5200XL came in at 87; but its long list of features helped it win our Best Buy honor, taking that distinction away from a longtime favorite, the Dell Dimension 4700.

The two new systems look quite different. The Gateway 5200XL appears sober and professional in its black-and-gray case. In contrast, the vertical ribs on the Velocity Micro ProMagix PCX's black alu-

minum case resemble those of a skyscraper, giving it a stylish look without being flashy.

The Gateway and the Velocity Micro are the only two systems on the value portion of the chart that offer prospective buyers both a DVD+RW drive and a DVD-ROM/CD-RW combination drive. In addition, each supplies a generous



**CHEM USA'S CHEMBOOK 2037** has a Webcam built into its lid.

number of ports and has a media-card reader on its front panel. One disappointment: Considering the Velocity Micro's nearly \$1900 price tag, we were unimpressed with its CRT. Even the \$999 CyberPower Gamer Ultra 7500 Elite comes with an LCD monitor.

### NOTEBOOKS

IF YOU ARE A FAN of Webcams, you'll want to check out the Chem USA ChemBook 2037, which boasts a camera

built into the lid for videoconferencing and for taking basic stills and videos. Our new number four desktop replacement notebook, the ChemBook also puts several of its connections—such as a four-in-one media card reader—on the front, where they're easy

to use. The unusually large battery sticking out from the rear of the unit makes the notebook difficult to use on your lap, but the battery lasted over 4 hours in our tests.

If you tend to prefer firm keyboards, head for our new number four all-purpose notebook, the Micro Express CL5620. Turning in a scorching WorldBench 5 mark of 97, the CL5620 outpaced every other 2-GHz Pentium M 755-equipped laptop on this month's chart except for the Polywell PolyNote 3015AW, which scored 98.

WinBook's X540 model is a well-rounded ultraportable. Though the keyboard is a tad mushy for our tastes, it's easy to type on for its size. The X540 put together the highest WorldBench 5 score among the ultraportables, and its Cinema button lets you watch a DVD movie without having to turn on the laptop.

### INSIDE INFO

#### Sharper Scanners

CANON'S FIRST flatbed scanner offering a 4800-by-9600-dpi optical resolution, the CanoScan 9950F, delivered both outstanding image quality and respectable speed. Perks include a rich software bundle and film adapters for formats from 35mm to 4 by 5 inches.

#### More on the Web

PC World uses its industry-standard benchmarking application, WorldBench 5, to evaluate desktop PCs, notebooks, and tablet PCs. We run a number of real-world applications performing real-world computing tasks. For more information on the WorldBench 5 tool, visit [find.pcworld.com/44262](http://find.pcworld.com/44262). Browse to [find.pcworld.com/10860](http://find.pcworld.com/10860) for more details about PC World's Star Ratings.

#### The Top 100 Team

Freelance writers Andre Kvitka and Scott Plamondon, Contributing Editor Carla Thornton, and PC World editors Laura Blackwell, Eric Butterfield, Tracey Capen, Kalpana Ettenson, Rebecca Freed, Melissa J. Perenson, Narasu Rebbapragada, Dan Sommer, and Alan Stafford contributed to the Top 100 section this month. Ulrike Diehlmann, Julio Gianobile, Elliott Kirschling, Jeff Kuta, Tony K. Leung, Thomas Luong, and William Wang of the PC World Test Center tested the products that we reviewed for this section, with logistical support provided by Julian Weatherby.



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## TOP 15 DESKTOP PCs

★ Products in this chart are ordered by star rating. Visit [find.pcworld.com/46318](http://find.pcworld.com/46318) for reviews of all products tested this month and ranked in this chart.

	POWER SYSTEM	Features and specifications <sup>1</sup>		Performance	Bottom line
1	Alienware Aurora 64 FX-55 <b>\$3846</b> (★★★★★ Feb 05) <a href="http://find.pcworld.com/45562">find.pcworld.com/45562</a>	• 2.6-GHz Athlon 64 FX-55 • 320GB drive space (RAID) • DVD±RW, DVD-ROM drives	• 19-inch NEC LCD monitor • 256MB ATI Radeon X800 Pro graphics • Logitech X-530 speakers	• WorldBench 5 score: 110 • Graphics: Outstanding • Design: Outstanding	Blazing performance pushes this well-equipped, nicely priced gaming machine to the top of the chart.
2	ABS Ultimate M5-64 <b>\$3899</b> (★★★★★ Feb 05) <a href="http://find.pcworld.com/45558">find.pcworld.com/45558</a>	• 2.6-GHz Athlon 64 FX-55 • 348GB drive space (RAID) • DVD±RW, DVD-ROM drives	• 19-inch Samsung LCD monitor • 256MB EVGA E-GeForce 6800 Ultra graphics • Logitech Z-680 speakers	• WorldBench 5 score: 107 • Graphics: Outstanding • Design: Very Good	Loaded PC has an industrial-strength metal case and a liquid-cooled CPU. Three hard drives in this configuration.
3	Dell Dimension 8400 <b>\$2999</b> <sup>2</sup> (★★★★★ Oct 04) <a href="http://find.pcworld.com/43544">find.pcworld.com/43544</a>	• 3.6-GHz Pentium 4 560 • 320GB drive space (RAID) • DVD±RW, CD-RW drives	• 19-inch Dell LCD monitor • 256MB ATI Radeon X800 XT graphics • Dell 5650 speakers	• WorldBench 5 score: 98 • Graphics: Outstanding • Design: Good	Quickest Pentium system on the chart; powerful graphics and an attractive LCD are a winning combo.
4	Alienware DHS 5 <b>\$5835</b> (★★★★★ Jan 05) <a href="http://find.pcworld.com/45194">find.pcworld.com/45194</a>	• 2.2-GHz Athlon 64 3500+ • 250GB drive space • DVD±RW/-RAM drive	• 30-inch BenQ LCD monitor • 128MB ATI Radeon 9800 Pro graphics • Klipsch Promedia Ultra 5.1 speakers	• WorldBench 5 score: 92 • Graphics: Outstanding • Design: Very Good	Our favorite Media Center PC in a stereo-component style; terrific LCD TV accounts for \$3450 of the price.
5	Micro Express MicroFlex 38A <b>Best Buy \$2699</b> (★★★★★ Nov 04) <a href="http://find.pcworld.com/43982">find.pcworld.com/43982</a>	• 2.4-GHz Athlon 64 3800+ • 250GB drive space • DVD±RW, CD-RW drives	• 19-inch ViewSonic LCD monitor • 256MB ATI Radeon X800 XT graphics • Logitech Z-560 speakers	• WorldBench 5 score: 106 • Graphics: Outstanding • Design: Good	Not the most interesting design, but it runs fast, sounds great, and displays impressive graphics.
6	Polywell Poly 939VF-FX53 <b>\$2880</b> (★★★★★ Nov 04) <a href="http://find.pcworld.com/43988">find.pcworld.com/43988</a>	• 2.4-GHz Athlon 64 FX-53 • 148GB drive space (RAID) • DVD±RW, DVD-ROM/CD-RW drives	• 19-inch AOC CRT monitor • 256MB EVGA E-GeForce 6800 Ultra graphics • Creative Inspire T7700 speakers	• WorldBench 5 score: 105 • Graphics: Outstanding • Design: Very Good	Has top-notch performance, but we would have expected better than a 19-inch CRT at this price.
7	HP Media Center PC M1050y <b>\$5010</b> (★★★★★ Jan 05) <a href="http://find.pcworld.com/45242">find.pcworld.com/45242</a>	• 3.8-GHz Pentium 4 570 • 400GB drive space • DVD±RW, DVD-ROM drives	• 23-inch HP LCD monitor • 256MB ATI Radeon X600 graphics • Klipsch ProMedia Ultra 5.1 speakers	• WorldBench 5 score: 96 • Graphics: Very Good • Design: Good	Ultimate home system offers a slot for a removable hard drive. Wide-screen LCD adds \$2000 to the total.
	VALUE SYSTEM				
1	Sys Technology MediaMax <b>\$1345</b> (★★★★★ Jan 05) <a href="http://find.pcworld.com/45208">find.pcworld.com/45208</a>	• 3.2-GHz Pentium 4 540 • 120GB drive space • DVD±RW drive	• 17-inch Planar LCD monitor • 128MB PNY Verto GeForce FX 5200 graphics • Sys MediaMax speakers	• WorldBench 5 score: 84 • Graphics: Very Good • Design: Good	Looks more like a stereo component than a PC; has stand-alone radio, DVD, and CD options.
2	IBM ThinkCentre A51p <b>\$1627</b> (★★★★★ Feb 05) <a href="http://find.pcworld.com/45626">find.pcworld.com/45626</a>	• 3-GHz Pentium 4 530 • 160GB drive space • DVD-ROM, CD-RW drives	• 17-inch ThinkVision LCD monitor • 64MB ATI Radeon X300 Pro graphics • Cyber Acoustics CA-3090 speakers	• WorldBench 5 score: 83 • Graphics: Very Good • Design: Good	Tool-less design and advanced security features distinguish this good-looking, all-business black tower.
3	Dell Dimension 4700 <b>\$1299</b> <sup>3</sup> (★★★★★ Oct 04) <a href="http://find.pcworld.com/43542">find.pcworld.com/43542</a>	• 3-GHz Pentium 4 530 • 160GB drive space • DVD-ROM, CD-RW drives	• 17-inch Dell LCD monitor • Integrated Intel 915G graphics • Dell ADA-425 speakers	• WorldBench 5 score: 83 • Graphics: Good • Design: Good	Improved graphics and sound, plus faster RAM, make update of past Best Buy suit both home and business.
4	Amax Kloss i915B <b>\$1649</b> (★★★★★ Feb 05) <a href="http://find.pcworld.com/45620">find.pcworld.com/45620</a>	• 2.8-GHz Pentium 4 520 • 120GB drive space • DVD-ROM/CD-RW combo drive	• 17-inch AG Neovo LCD monitor • 128MB NVIDIA GeForce PCX 5750 graphics • AOpen SoundSphere 2.1 speakers	• WorldBench 5 score: 83 • Graphics: Very Good • Design: Good	Sleek, stylish shoe-box system will appear terrific in any setting; see-through speakers match well.
5	CyberPower Gamer Ultra 7500 Elite <b>\$999</b> (★★★★★ Feb 05) <a href="http://find.pcworld.com/45622">find.pcworld.com/45622</a>	• 2.2-GHz Athlon 64 3200+ • 120GB drive space • DVD±RW drive	• 17-inch AOpen LCD monitor • 256MB NVIDIA GeForce FX 5700LE graphics • Creative SBS 5.1 560 speakers	• WorldBench 5 score: 91 • Graphics: Very Good • Design: Good	Funky-looking system includes top-mounted USB and audio ports and a pop-up status panel.
6	Alienware Bot <b>\$1441</b> (★★★★★ Dec 04) <a href="http://find.pcworld.com/44204">find.pcworld.com/44204</a>	• 3-GHz Pentium 4 530 • 120GB drive space • DVD±RW drive	• 17-inch NEC LCD monitor • Integrated Intel 915G graphics • Logitech Z-640 speakers	• WorldBench 5 score: 83 • Graphics: Very Good • Design: Good	Compact business PC has tool-less servicing and a case lock, but room for future expansion is limited.
7	Gateway 5200XL <b>Best Buy \$1410</b> (★★★★★ NEW) <a href="http://find.pcworld.com/46282">find.pcworld.com/46282</a>	• 3.2-GHz Pentium 4 540 • 200GB drive space • DVD±RW, DVD-ROM/CD-RW drives	• 17-inch Gateway LCD monitor • 128MB ATI Radeon X600 Pro graphics • Gateway GMAX 2100 2.1 speakers	• WorldBench 5 score: 87 • Graphics: Very Good • Design: Fair	A roomy 200GB hard drive, nice LCD, and good performance make this PC an excellent catch for the price.
8	Velocity Micro ProMagix PCX <b>\$1890</b> (★★★★★ NEW) <a href="http://find.pcworld.com/46276">find.pcworld.com/46276</a>	• 3.4-GHz Pentium 4 550 • 200GB drive space • DVD±RW, DVD-ROM/CD-RW drives	• 19-inch CTX CRT monitor • 128MB EVGA E-GeForce 6600 graphics • Creative Inspire P5800 speakers	• WorldBench 5 score: 94 • Graphics: Very Good • Design: Very Good	Fast system is very expandable; all-black aluminum case is attractive. But at this price, you deserve an LCD.

**FOOTNOTES:** <sup>1</sup>Features listings are not exhaustive; hard-drive capacity may represent multiple drives. <sup>2</sup>Use Dell Value Code 6V411-840REV to get this price. <sup>3</sup>Use Dell Value Code 6V411-470REV to get this price. **CHART NOTES:** Street prices are as of 12/9/04. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings. Price is taken into consideration for Best Buy honors only. All tests designed and conducted by the PC World Test Center. All rights reserved.



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# TOP 15 NOTEBOOK PCs

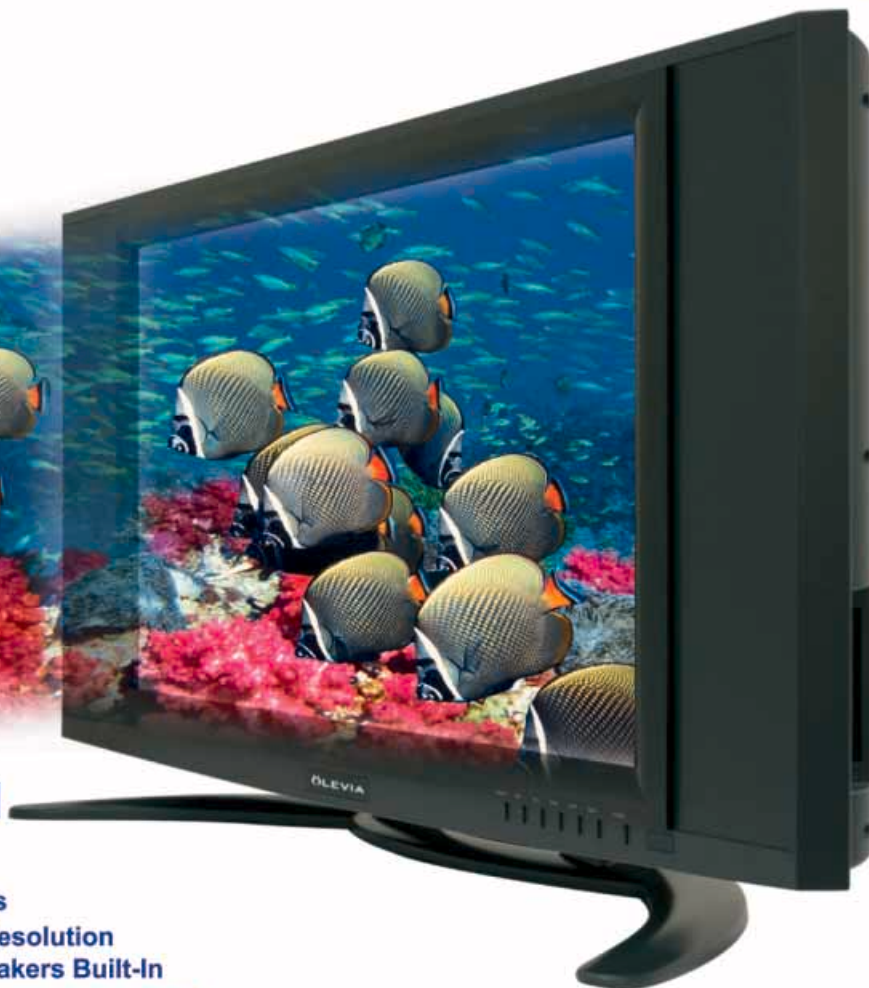
★ Products in this chart are ranked by star rating. Visit [find.pcworld.com/46176](http://find.pcworld.com/46176) for reviews of all products tested this month and ranked in this chart.

	DESKTOP REPLACEMENT	Features and specifications <sup>1</sup>		Performance	Bottom line
1	<b>HP Compaq Business Nc6000</b> <b>Best Buy</b> \$1824 (★★★★★ May 04) <a href="http://find.pcworld.com/41093">find.pcworld.com/41093</a>	• 1.6-GHz Pentium M 725 • 14.1-inch screen • 6.6 pounds	• DVD-ROM and CD-RW combo drive • Touchpad and eraserhead pointing devices • 802.11a/g, Bluetooth, gigabit ethernet	• WorldBench 5 score: 74 • Overall design: Very Good • Tested battery life: 6:23	Lightweight corporate notebook comes with dual wireless capabilities and has the longest battery life here.
2	<b>Dell Inspiron 8600</b> \$2705 (★★★★★ Nov 04) <a href="http://find.pcworld.com/44058">find.pcworld.com/44058</a>	• 2-GHz Pentium M 755 • 15.4-inch wide-screen • 8.3 pounds	• DVD+RW drive • 802.11g, Corel WordPerfect Productivity Pack	• WorldBench 5 score: 90 • Overall design: Very Good • Tested battery life: 4:32	Convenient design touches and good sound make up for this speedy laptop's thick case.
3	<b>Dell Latitude D600</b> \$2125 (★★★★★ Jan 05) <a href="http://find.pcworld.com/44960">find.pcworld.com/44960</a>	• 2-GHz Pentium M 755 • 14.1-inch screen • 6.4 pounds	• DVD+RW drive • Touchpad and eraserhead pointing devices • 802.11g, Bluetooth, gigabit ethernet	• WorldBench 5 score: 81 • Overall design: Very Good • Tested battery life: 4:02	Fast and light, this full-featured notebook offers a multipurpose bay and dual pointing devices.
4	<b>Chem USA ChemBook 2037</b> \$1899 (★★★★★ NEW) <a href="http://find.pcworld.com/46170">find.pcworld.com/46170</a>	• 2-GHz Pentium M 755 • 15.4-inch wide-screen • 8.7 pounds	• DVD-RW drive • 802.11g, four-in-one media card reader, built-in camera	• WorldBench 5 score: 89 • Overall design: Good • Tested battery life: 4:13	This well-rounded model features an 800-by-600 VGA camera in its lid and a high-performance battery.
5	<b>IBM ThinkPad T42</b> \$2269 (★★★★★ Feb 05) <a href="http://find.pcworld.com/45860">find.pcworld.com/45860</a>	• 1.8-GHz Pentium M 745 • 14.1-inch screen • 6.3 pounds	• DVD-ROM and CD-RW combo drive • Touchpad and eraserhead pointing devices • 802.11g, fingerprint scanner	• WorldBench 5 score: 77 • Overall design: Good • Tested battery life: 5:34	Slide fingerprint reader is a bit finicky, but this laptop has an industry-leading electronic manual.
ALL-PURPOSE NOTEBOOK					
1	<b>Acer TravelMate 8000</b> \$2499 (★★★★★ Sept 04) <a href="http://find.pcworld.com/43074">find.pcworld.com/43074</a>	• 2-GHz Pentium M 755 • 15-inch screen • 7.6 pounds	• DVD±RW/-RAM drive • 802.11g, Bluetooth, gigabit ethernet, SmartCard, four-in-one media card reader	• WorldBench 5 score: 89 • Overall design: Very Good • Tested battery life: 4:38	This business model boasts elegant design, moderate weight, and a flexible DVD burner.
2	<b>IBM ThinkPad R51</b> <b>Best Buy</b> \$1549 (★★★★★ Sept 04) <a href="http://find.pcworld.com/43118">find.pcworld.com/43118</a>	• 1.5-GHz Pentium M 715 • 15-inch screen • 7.4 pounds	• DVD-ROM and CD-RW combo drive • Touchpad and eraserhead pointing devices • 802.11g, gigabit ethernet	• WorldBench 5 score: 67 • Overall design: Outstanding • Tested battery life: 3:54	The slim R51 suits users who don't require many bells and whistles. Excellent keyboard.
3	<b>Polywell Polynote 3015AW</b> \$2150 (★★★★★ Nov 04) <a href="http://find.pcworld.com/44062">find.pcworld.com/44062</a>	• 2-GHz Pentium M 755 • 15.4-inch wide-screen • 7.6 pounds	• DVD+RW drive • 802.11g, four-in-one media card reader	• WorldBench 5 score: 98 • Overall design: Very Good • Tested battery life: 3:03	This fast notebook has a firm keyboard, a swappable DVD burner, and audio buttons.
4	<b>Micro Express CL5620</b> \$1599 (★★★★★ NEW) <a href="http://find.pcworld.com/46172">find.pcworld.com/46172</a>	• 2-GHz Pentium M 755 • 15-inch screen • 7.2 pounds	• DVD±RW drive • 802.11g, SD Card slot	• WorldBench 5 score: 97 • Overall design: Fair • Tested battery life: 3:56	Elegant-looking portable offers a beautiful high-resolution screen and an ultrafirm keyboard.
5	<b>Fujitsu LifeBook S7010</b> \$1999 (★★★★★ Oct 04) <a href="http://find.pcworld.com/43354">find.pcworld.com/43354</a>	• 1.7-GHz Pentium M 735 • 14.1-inch wide-screen • 5.1 pounds	• DVD-ROM and CD-RW combo drive • 802.11g, Bluetooth, gigabit ethernet	• WorldBench 5 score: 75 • Overall design: Good • Tested battery life: 3:51	The light S7010 is a good choice for business travelers, but its hard drive is not user-upgradable.
ULTRAPORTABLE					
1	<b>Dell Latitude X300</b> \$2364 <sup>2</sup> (★★★★★ Dec 04) <a href="http://find.pcworld.com/44250">find.pcworld.com/44250</a>	• 1.4-GHz Pentium M LV 738 • 12.1-inch screen • 4.0 pounds	• External DVD+RW drive • 802.11g, SD Card slot, docking station	• WorldBench 5 score: 73 • Overall design: Very Good • Tested battery life: 2:31	This relatively fast Latitude is expandable, thanks to the best docking station we've seen in this class.
2	<b>Fujitsu LifeBook P7010D</b> <b>Best Buy</b> \$2099 (★★★★★ Dec 04) <a href="http://find.pcworld.com/44260">find.pcworld.com/44260</a>	• 1.1-GHz Pentium M ULV 713 • 10.6-inch screen • 4.1 pounds	• DVD-ROM and CD-RW combo drive • 802.11a/g, four-in-one media card reader, fingerprint scanner, Microsoft Works 7	• WorldBench 5 score: 58 • Overall design: Very Good • Tested battery life: 5:15	Light unit with a fingerprint reader lasts ages on a battery charge and has extra card slots.
3	<b>Dell Inspiron 700m</b> \$1916 (★★★★★ Dec 04) <a href="http://find.pcworld.com/44246">find.pcworld.com/44246</a>	• 1.8-GHz Pentium M 745 • 12.1-inch wide-screen • 4.8 pounds	• DVD+RW drive • 802.11g, SD Card slot, Corel WordPerfect Productivity Pack	• WorldBench 5 score: 80 • Overall design: Good • Tested battery life: 2:45	This strongly built, lightweight notebook offers a wide-aspect screen but has a cramped keyboard.
4	<b>IBM ThinkPad X40</b> \$2299 <sup>2</sup> (★★★★★ Sept 04) <a href="http://find.pcworld.com/43066">find.pcworld.com/43066</a>	• 1.2-GHz Pentium M 745 • 12.1-inch screen • 5.6 pounds	• External DVD-ROM and CD-RW combo drive • 802.11g, Bluetooth, gigabit ethernet, SD Card slot, docking station	• WorldBench 5 score: 55 • Overall design: Good • Tested battery life: 2:36	Ultraportable ThinkPad boasts the finest keyboard for its size. Optical drive is USB- or dock-based.
5	<b>WinBook X540</b> \$1699 (★★★★★ NEW) <a href="http://find.pcworld.com/46174">find.pcworld.com/46174</a>	• 2-GHz Pentium M 755 • 12.1-inch screen • 5.5 pounds	• DVD±RW drive • 802.11g, three-in-one media card reader	• WorldBench 5 score: 83 • Overall design: Good • Tested battery life: 3:03	You can watch DVD movies, home videos, and slide shows without having to turn this lightweight laptop on.

**FOOTNOTES:** <sup>1</sup>Features listings are not exhaustive. <sup>2</sup>Price includes extra-cost docking station. **CHART NOTES:** Street price as of 12/10/04. Weight includes AC adapter, power cord, and optical drive. Optical drives are removable unless otherwise noted. Price is taken into consideration for Best Buy honors only. All tests designed and conducted by the PC World Test Center. All rights reserved. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings.

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# TOP 10 MONITORS

★ Products in this chart are ranked by star rating. Visit [find.pcworld.com/46300](http://find.pcworld.com/46300) for reviews of all products tested this month and ranked in this chart.

THIS MONTH, WE TESTED an almost completely new crop of 17-inch LCD monitors under improved lighting and ergonomic conditions. The highly adjustable Eizo FlexScan L568 tied for the highest score on our graphics test, sweeping into first place on the chart. Though it's burdened with the highest price here, this model is a good value for anyone in the market for a professional-grade display, thanks to its combination of fine image quality and comprehensive features. Dell's UltraSharp 1704FPV tied for second on overall image quality and sweetens the deal with four USB 2.0 ports, two of them

conveniently located on the left edge of the bezel—just the spot for connecting memory keys or desktop peripherals.



EIZO FLEXSCAN L568

Although the Iiyama ProLite E435S-B earned the best overall marks for image quality (tying for the highest graphics scores and handily winning the text race), its lack of adjustments and Iiyama's rather stingy weekday-only service plan drop it below a number of models that have more adjustment options and better support. The low price quoted by Iiyama looked tempting, but we couldn't buy the E435S-B in the United States on the pricing date; and that factor bumped it from Best Buy contention.

	17-INCH LCD MONITOR	Features and specifications <sup>1</sup>		Performance	Bottom line
1	Eizo FlexScan L568 \$549 (★★★★★ NEW) <a href="http://find.pcworld.com/46180">find.pcworld.com/46180</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt, swivel, pivot, and height</li></ul>	<ul style="list-style-type: none"><li>25ms response time</li><li>12.8 pounds</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Very Good</li><li>Usability: Very Good</li></ul>	Professional model tied the number two Dell for second-best overall image quality. Extensive controls make it a fine choice for demanding apps.
2	Dell UltraSharp 1704FPV <b>Best BUY</b> \$369 (★★★★★ NEW) <a href="http://find.pcworld.com/46178">find.pcworld.com/46178</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt, swivel, pivot, and height</li></ul>	<ul style="list-style-type: none"><li>25ms response time</li><li>13.5 pounds</li><li>Four-port USB 2.0 hub; speakers optional</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Very Good</li><li>Usability: Very Good</li></ul>	Great all-purpose display delivers terrific image quality, a full range of adjustments, and well-chosen extras at a reasonable price.
3	Samsung SyncMaster 711t \$500 (★★★★★ NEW) <a href="http://find.pcworld.com/46298">find.pcworld.com/46298</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt, swivel, pivot, and height</li></ul>	<ul style="list-style-type: none"><li>22ms response time</li><li>12.8 pounds</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Very Good</li><li>Usability: Very Good</li></ul>	Included MagicTune software lets you tweak on-screen settings with mouse clicks instead of with a cumbersome series of button pushes.
4	Sharp LL-172G <b>Best BUY</b> \$420 (★★★★★ NEW) <a href="http://find.pcworld.com/46192">find.pcworld.com/46192</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt, swivel, and height</li></ul>	<ul style="list-style-type: none"><li>16ms response time</li><li>12.4 pounds</li><li>Built-in speakers</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Good</li><li>Usability: Very Good</li></ul>	Attractive design touches include a headphone jack in front, easy-to-find buttons under the bezel, and easily lockable height adjustment.
5	IBM ThinkVision L170p \$499 (★★★★★ RETESTED) <a href="http://find.pcworld.com/37499">find.pcworld.com/37499</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt, swivel, and height</li></ul>	<ul style="list-style-type: none"><li>25ms response time</li><li>12.6 pounds</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Very Good</li><li>Usability: Very Good</li></ul>	Well-built model performs competently across the board; large, curved buttons are comfortable and easy to use, even for large hands.
6	ViewSonic VP171b \$410 (★★★★★ NEW) <a href="http://find.pcworld.com/46184">find.pcworld.com/46184</a>	<ul style="list-style-type: none"><li>Inputs: Two analog and one digital</li><li>Adjustments: Tilt, swivel, pivot, and height</li></ul>	<ul style="list-style-type: none"><li>8ms response time</li><li>18.7 pounds</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Good</li><li>Usability: Very Good</li></ul>	Full range of physical adjustments lets you work comfortably. Overall image quality, though very good, trails that of other models on the chart.
7	Iiyama ProLite E435S-B \$279 (★★★★★ NEW) <a href="http://find.pcworld.com/46168">find.pcworld.com/46168</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt</li></ul>	<ul style="list-style-type: none"><li>10ms response time</li><li>7.7 pounds</li><li>Built-in speakers</li></ul>	<ul style="list-style-type: none"><li>Text quality: Outstanding</li><li>Graphics quality: Very Good</li><li>Usability: Good</li></ul>	Display's character-smoothing technology led to chart-topping text scores. The price is excellent, but there's no tech support on weekends.
8	CTX Technology F773 \$440 (★★★★★ NEW) <a href="http://find.pcworld.com/46182">find.pcworld.com/46182</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt</li></ul>	<ul style="list-style-type: none"><li>16ms response time</li><li>11.0 pounds</li><li>Built-in speakers</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Very Good</li><li>Usability: Good</li></ul>	LCD has character-smoothed text and eye-popping color; carrying handle enhances well-made stand's appeal. Menus could be easier to navigate.
9	LG Electronics Flatron L1730S \$429 (★★★★★ NEW) <a href="http://find.pcworld.com/46188">find.pcworld.com/46188</a>	<ul style="list-style-type: none"><li>Inputs: One analog</li><li>Adjustments: Tilt</li></ul>	<ul style="list-style-type: none"><li>12ms response time</li><li>10.8 pounds</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Good</li><li>Usability: Very Good</li></ul>	This dignified-looking unit has no digital input and includes few extras, but it offers color-adjusting software for fine-tuning screen settings.
10	NEC MultiSync LCD1735NXM \$420 (★★★★★ NEW) <a href="http://find.pcworld.com/46198">find.pcworld.com/46198</a>	<ul style="list-style-type: none"><li>Inputs: One analog and one digital</li><li>Adjustments: Tilt</li></ul>	<ul style="list-style-type: none"><li>16ms response time</li><li>10.4 pounds</li></ul>	<ul style="list-style-type: none"><li>Text quality: Very Good</li><li>Graphics quality: Good</li><li>Usability: Good</li></ul>	Light-up membrane controls and a cylindrical speaker bar give this unit a clean, sleek appearance; but its tilt adjustment is stiff.

**FOOTNOTE:** <sup>1</sup>Digital inputs require a graphics card with a DVI digital output, which we use to test all monitors that offer DVI. **HOW WE TEST:** Judges rate how well each monitor displays 13 text and graphics images at a native resolution of 1280 by 1024. Some test screens are from DisplayMate for Windows ([www.displaymate.com](http://www.displaymate.com)). See [find.pcworld.com/34613](http://find.pcworld.com/34613) for testing details. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Prices given are street prices as of 12/17/04. Star ratings are based on text quality, graphics quality, features, ease of use, and service and support. Price is taken into consideration for Best Buy honors only. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings.

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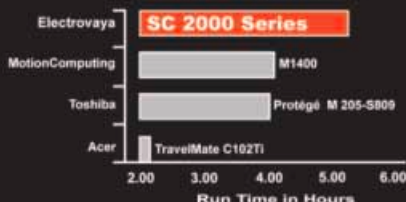
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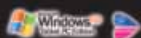
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# TOP 10 SCANNERS

★ Products in this chart are ranked by star rating. Visit [find.pcworld.com/46412](http://find.pcworld.com/46412) for reviews of all products tested this month and ranked in this chart.

TWO EPSON SCANNERS debut on this month's chart. Upon a second look at the Epson Perfection 2580 Photo (our first take was in last September's *New Products*, [find.pcworld.com/46424](http://find.pcworld.com/46424)), we gave it our small-office Best Buy award for its speed and attractive color scans. The transparency feeder in the 2580's lid makes scanning negatives very easy, too. (Note that the similar Epson Perfection 2480 Photo debuted in the September *Top 5 Scanners* chart.)

Aimed at more serious photo hobbyists, the Epson Perfection 4180 Photo offers 4800-by-9600-dpi optical resolution and in our tests captured particularly crisp scans of black-and-white line art.



EPSON'S Perfection 4180 Photo.

On the corporate half of the chart, Canon's CanoScan 9950F premieres at number one and earns our Best Buy award. With 4800-by-9600-dpi optical resolution, it excelled in our black-and-white and color image-quality tests; scan speeds were above average across the board.

Two scanners we tested this month did not make the chart. Plustek's OpticBook 3600, while fast, has only 1200-by-1200-dpi resolution and ranked near the bottom in image quality. Its case design lets a book lie flat against the scan glass. The Microtek ScanMaker i700, with a legal-size scan bed, was slow and captured average image quality despite its 4800-by-9600-dpi resolution.

	SMALL-OFFICE SCANNER	Features and specifications	Performance	Bottom line
1	<b>Epson Perfection 2580 Photo</b> <b>Best Buy</b> \$149 (★★★★★ NEW) <a href="http://find.pcworld.com/46364">find.pcworld.com/46364</a>	<ul style="list-style-type: none"> <li>• 2400 by 4800 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-11.7-inch scanning area</li> <li>• 10.83-by-16.5-by-3.4-inch case</li> <li>• Built-in transparency adapter; optional photo and business card feeder</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Very Good</li> <li>• Speed: Outstanding</li> <li>• 300-dpi scan: 21 seconds</li> </ul>	The Auto Film loader in the lid lets you scan 35mm negatives. Scan speeds, especially for small color photos, were fast.
2	<b>Epson Perfection 4180 Photo</b> \$199 (★★★★★ NEW) <a href="http://find.pcworld.com/46366">find.pcworld.com/46366</a>	<ul style="list-style-type: none"> <li>• 4800 by 9600 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-11.7-inch scanning area</li> <li>• 10.87-by-18.03-by-4.6-inch case</li> <li>• Includes 35mm slide adapter; optional automatic document feeder</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Very Good</li> <li>• Speed: Very Good</li> <li>• 300-dpi scan: 20 seconds</li> </ul>	This advanced consumer scanner captured excellent image quality. Its speed was comparable to that of the rest of the pack.
3	<b>Epson Perfection 2480 Photo</b> \$99 (★★★★★ Sept 04) <a href="http://find.pcworld.com/43114">find.pcworld.com/43114</a>	<ul style="list-style-type: none"> <li>• 2400 by 4800 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-11.7-inch scanning area</li> <li>• 16.5-by-10.8-by-3.4-inch case</li> <li>• Built-in transparency adapter; optional photo and business card feeder</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Very Good</li> <li>• Speed: Very Good</li> <li>• 300-dpi scan: 23 seconds</li> </ul>	This model turns out fast, good-quality scans and includes features for cleaning up defects such as dust or scratches.
4	<b>HP Scanjet 5550c</b> \$299 (★★★★★ Apr 03) <a href="http://find.pcworld.com/34406">find.pcworld.com/34406</a>	<ul style="list-style-type: none"> <li>• 2400 by 2400 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-11.7-inch scanning area</li> <li>• 19.2-by-13.4-by-6.3-inch case</li> <li>• Optional lighted transparency adapter; includes 35-page ADF</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Good</li> <li>• Speed: Very Good</li> <li>• 300-dpi scan: 19 seconds</li> </ul>	The only small-office model we've seen lately with an ADF, this HP posted middling image-quality scores.
5	<b>Microtek ScanMaker i320</b> \$130 (★★★★★ May 04) <a href="http://find.pcworld.com/41543">find.pcworld.com/41543</a>	<ul style="list-style-type: none"> <li>• 3200 by 6400 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-11.7-inch scanning area</li> <li>• 11.6-by-19.1-by-3-inch case</li> <li>• External transparency adapter handles one slide at a time; no ADF</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Fair</li> <li>• Speed: Very Good</li> <li>• 300-dpi scan: 29 seconds</li> </ul>	This scanner produces nice color, but its transparency adapter holds only one 35mm slide.
	CORPORATE SCANNER			
1	<b>Canon CanoScan 9950F</b> <b>Best Buy</b> \$399 (★★★★★ NEW) <a href="http://find.pcworld.com/46362">find.pcworld.com/46362</a>	<ul style="list-style-type: none"> <li>• 4800 by 9600 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-11.7-inch scanning area</li> <li>• 11.4-by-20-by-5-inch case</li> <li>• Includes transparency adapters for up to 4 by 5 inches; no ADF</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Outstanding</li> <li>• Speed: Very Good</li> <li>• 300-dpi scan: 26 seconds</li> </ul>	Canon's first optical 4800-dpi flatbed captured top-notch image quality and comes with two photo-software packages.
2	<b>HP Scanjet 8200</b> \$500 (★★★★★ Oct 03) <a href="http://find.pcworld.com/37382">find.pcworld.com/37382</a>	<ul style="list-style-type: none"> <li>• 4800 by 4800 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-14-inch scanning area</li> <li>• 22.5-by-16-by-5.25-inch case</li> <li>• Includes transparency adapter; ADF optional</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Very Good</li> <li>• Speed: Outstanding</li> <li>• 300-dpi scan: 11 seconds</li> </ul>	The speediest scanner on the chart has six buttons and more software than HP's consumer units do.
3	<b>Microtek ScanMaker i900</b> \$600 (★★★★★ Sept 04) <a href="http://find.pcworld.com/43110">find.pcworld.com/43110</a>	<ul style="list-style-type: none"> <li>• 3200 by 6400 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-14-inch scanning area</li> <li>• 15.2-by-23.6-by-6.3-inch case</li> <li>• Built-in lower bay for scanning transparencies; no ADF</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Very Good</li> <li>• Speed: Good</li> <li>• 300-dpi scan: 37 seconds</li> </ul>	This professional scanner has extensive software controls. An internal drawer allows glassless transparency scanning.
4	<b>HP Scanjet 5590</b> \$399 (★★★★★ Sept 04) <a href="http://find.pcworld.com/43112">find.pcworld.com/43112</a>	<ul style="list-style-type: none"> <li>• 2400 by 2400 dpi</li> <li>• USB 2.0</li> <li>• 8.5-by-11-inch scanning area</li> <li>• 19.2-by-13.4-by-6.4-inch case</li> <li>• Includes transparency adapter and 50-sheet ADF</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Very Good</li> <li>• Speed: Very Good</li> <li>• 300-dpi scan: 20 seconds</li> </ul>	Best suited for heavy office use, the Scanjet 5590 has a 50-page ADF that enables two-sided scanning.
5	<b>Epson Perfection 4870 Photo</b> \$449 (★★★★★ May 04) <a href="http://find.pcworld.com/41564">find.pcworld.com/41564</a>	<ul style="list-style-type: none"> <li>• 4800 by 9600 dpi</li> <li>• USB 2.0, FireWire</li> <li>• 8.5-by-11.7-inch scanning area</li> <li>• 12-by-18.7-by-5.3-inch case</li> <li>• Includes transparency adapter and photo feeder for batch scanning</li> </ul>	<ul style="list-style-type: none"> <li>• Image quality: Good</li> <li>• Speed: Very Good</li> <li>• 300-dpi scan: 20 seconds</li> </ul>	This high-resolution scanner gets good marks for its color accuracy and ability to capture fine details.

**HOW WE TEST:** We run time tests for line art and for color and grayscale photo samples, on which a panel of judges rates image quality. Data based on tests designed by the PC World Test Center. All rights reserved. **CHART NOTES:** Street prices are as of 12/10/04. Listed resolution is the maximum optical resolution. All USB 2.0 devices are backward-compatible with USB 1.1 ports; we test with USB 2.0 (unless otherwise noted). Case dimensions are in order: width, depth, height. Performance scores are for a 300-dpi scan of a black-and-white art sample. Star ratings are based on scan quality, features, ease of use, speed, and service and support. Price is taken into consideration for Best Buy honors only. See [find.pcworld.com/10860](http://find.pcworld.com/10860) for details on PC World's Star Ratings.



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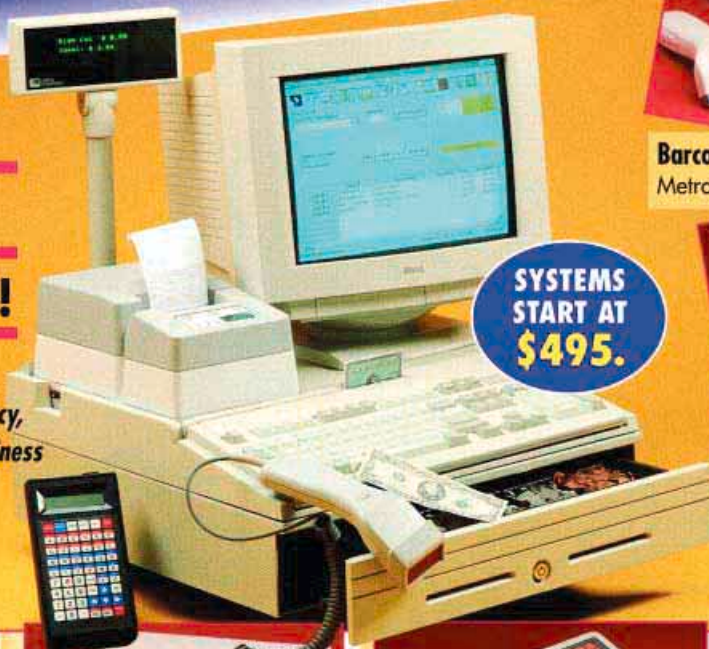
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# MORE REVIEWS

MISSED AN ISSUE OF *PC World* or passed your copy along to a friend? Here's a recap of *Top 100* topics from previous issues. To read reviews of the products listed in these charts, go online and type in the *PC World* Find-It URL from the top

of each chart. Next month in the *Top 100*, we'll look at 19-inch LCD monitors and point-and-shoot digital cameras, and our Spotlight review will cover dual-layer DVD players. Also be on the lookout for an in-depth feature on inkjet printers.



**CANON'S POWERSHOT G6**, with 7.1 megapixels, exhibited great image quality.



**DELL'S 3000cn** produced top-notch prints at a very economical price.

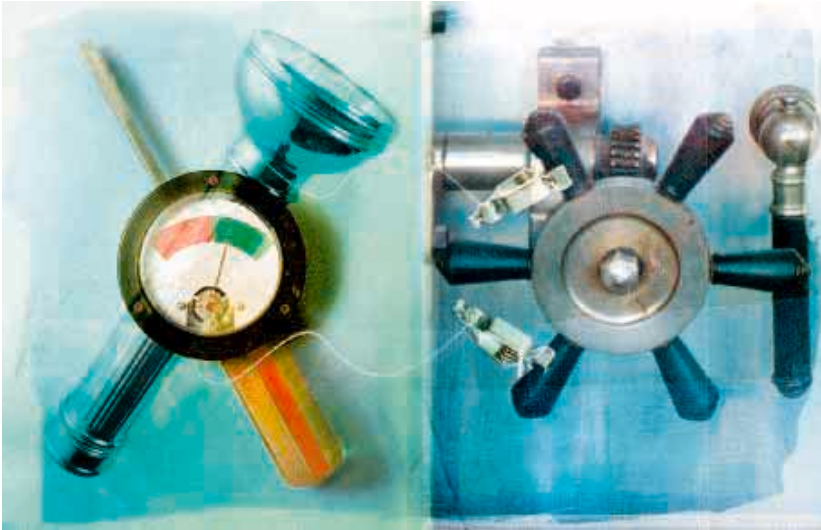


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5	Nikon Coolpix 8800 (★★★★★ Feb 05) find.pcworld.com/45732	5	Konica Minolta MagiColor 5430L (★★★★★ Feb 05) find.pcworld.com/45978	5	LG Electronics Super-Multi GSA-4160B (★★★★★ Jan 05) find.pcworld.com/45384
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7	Canon PowerShot Pro1 (★★★★★ Sept 04) find.pcworld.com/43164	1	Xerox Phaser 7300N (★★★★★ Feb 05) find.pcworld.com/45976	7	Pioneer DVR-A08XLA (★★★★★ Jan 05) find.pcworld.com/45364
8	Nikon D70 (★★★★★ Dec 04) find.pcworld.com/44876	2	HP Color LaserJet 5550n (★★★★★ Feb 05) find.pcworld.com/45968	8	TDK Internal IndiDVD 12x+/8x-Multiformat Burner (★★★★★ Oct 04) find.pcworld.com/43812
9	Olympus C-7000 Zoom <b>Best BUY</b> (★★★★★ Feb 05) find.pcworld.com/45736	3	Lexmark C762n <b>Best BUY</b> (★★★★★ Feb 05) find.pcworld.com/45982	9	Pacific Digital Mach-16 (★★★★★ Jan 05) find.pcworld.com/45532
10	Sony Cyber-shot DSC-V3 (★★★★★ Feb 05) find.pcworld.com/45738	4	Okidata C7350n (★★★★★ Feb 05) find.pcworld.com/45980	10	Teac DVW58G (★★★★★ Aug 04) find.pcworld.com/42876
From the February 2005 Issue		From the February 2005 Issue		From the January 2005 Issue	

# HERE'S HOW

EDITED BY REBECCA FREED, AOIFE McEVoy, AND DENNIS O'REILLY



## WINDOWS TIPS

SCOTT DUNN

### Create Your Own Windows Security Analysis Tool



THESE DAYS, security is on everyone's mind—as well as on everyone's computer screen. Security warnings pop up in your Web browser, your e-mail, your antivirus software, your network settings, and all your other apps. But tracking every nook and cranny where Windows hides its security settings—and choosing the correct ones—can be a full-time job.

Fortunately, Windows XP Professional and 2000 contain the building blocks of a

comprehensive security analysis and configuration tool. (If you have XP Home, the security built into Service Pack 2 should meet your needs.) But you have to assemble the components into a security suite yourself. I'll show you how to put the utility together, use it to analyze your system, and decide what actions to take based on the results. While Windows' Security Configuration and Analysis utility does not address security for e-mail and other apps, it lets you assign all of Windows'

system-level security settings in one place.

Changes to security settings can affect your network and Internet connections, your applications, and Windows' own Registry settings, so back up your system before embarking on any serious tweaking. (See [find.pcworld.com/45578](http://find.pcworld.com/45578) to read "Care and Feeding of the Windows Registry" from Stan Miastkowski's May 2002 *Step By Step* column.) After each change of setting, test your applications and network connection to make sure they're working properly. If a problem crops up, restore your Registry as explained in Lincoln Spector's April 2003 *Answer Line* column, "How Do I Restore My Windows Registry?" ([find.pcworld.com/45580](http://find.pcworld.com/45580)).

#### BUILD YOUR SOFTWARE

TO CREATE YOUR custom security tool, log in as an administrator, choose *Start•Run*, type **mmc**, and press **<Enter>**. In Windows XP, choose *File•Add/Remove Snap-in*. In Windows 2000, click *Console•Add/Remove Snap-in* from the Console1 main menu. In both versions, click *Add*, select *Security Configuration and Analysis*, click *Add* again, and then *Close* and *OK*.

The little Console Root icon in the window now has a subicon, but no other real branches to its tree. To add a subentry for the icon, create a database of your settings: Right-click *Security Configuration and Analysis* and choose *Open Database*. In the 'File name' box, type the name of your database—for example, **my security settings**—and press **<Enter>** to be prompted to import a template. (If you don't see this dialog, or if you cancel it accidentally, right-click *Security Configuration and Analysis* and choose *Import template*.)

The templates range from the default Windows settings (setup.security.inf) to





chore is not suited to your system. To find a better match in Windows XP, choose *Start•Help and Support*. In the search box, type **Predefined security templates** and press **<Enter>**. Click *Predefined security templates* in the left pane to view the nitty-gritty on these templates in the right pane. In Windows 2000, click the question-mark Help icon at the far right of the security utility's toolbar. With the Contents tab in front, select *Security Configuration and Analysis•Advanced Topics•Predefined templates*. The info you need is in the right pane.

If you find a better template fit, select *Security Configuration and Analysis* in the left pane and choose *Action•Import Template* (or right-click the icon and choose *Import Template* from the context menu). In the Import Template dialog box, check *Clear this database before importing* to replace the current template. Otherwise, you'll end up with a composite of settings from multiple templates. Select the desired template, click *Open*, and repeat the analysis as explained above.

**Tweak individual settings:** If you're the supercautious type and just can't leave well enough alone, inspect the settings that diverge from the template database and decide one by one whether and how to change them. The safest way to do this is to use an entirely different tool for the analysis than you used to create the template. For example, if the settings you want to change are in the Account Policies or Local Policies sections of your new

tool, choose *Start•Programs•Administrative Tools•Local Security Policy* (in XP it's *Start•All Programs•Administrative Tools•Local Security Policy*), or choose *Start•Run*, type **secpol.msc /s**, and press **<Enter>**.

With the Local Security Policy tool (Local Security Settings in Windows 2000), only the settings you change get applied to your system; but with the Security Configuration and Analysis tool, you risk applying dozens of unknown template settings. In this case, limit use of the latter utility to determining which items to adjust via the Local Security Policy tool.

Windows XP describes each icon in the Account Policies or Local Policies sections of the Local Security Policy and Security Configuration and Analysis tools. To access these descriptions, choose *Start•Help and Support*, type **Account and local policies** in the search box, and press **<Enter>**. In the Search Results pane, select *Full-text Search Matches* and click *Account and local policies*. Use the text and links on the right to locate the information you need. Windows 2000 lacks this information, but you can click the Help icon at the far right of the toolbar and select *Contents•Security Configuration and Analysis•Advanced Topics* for some guidance.

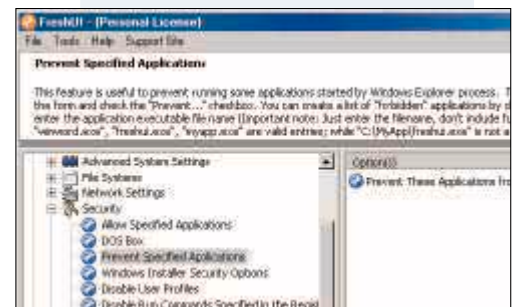
**Go for broke:** If you are used to tinkering with your system's advanced settings, you can use the Security Configuration and Analysis tool to apply some or all of a template's settings. To make only selected changes to your machine's current configuration, double-click an icon in the right pane whose settings you think you should change (such as one with an X in a red circle). Then check or uncheck the desired boxes in the Database Setting column (in the dialog boxes where it appears), or adjust other settings in the dialog box.

When you have finished making your changes, click *OK* and choose *File•Save*. To apply the changes to your PC, select *Security Configuration and Analysis* in the left pane and choose *Action•Configure Computer Now*. Either type a path for the

## WINDOWS TOOLBOX

### Better Windows Tweaking and Security for Free

**Windows 2K XP 98 ME** THE NEW VERSION of Fresh UI, the handy, dandy Windows configuration tool, features improved settings for customizing every little thing about Windows. In addition, the program protects your privacy and enhances your system's security. Access dozens of options via the utility's familiar tree pane on the left. A column in the right pane lets you know



which Windows versions support the selected setting. The program's help pane provides a brief explanation of the selected settings group. Though you have to supply the company with an e-mail address to get the registration code needed to install Fresh UI, the product is completely free. Visit [find.pcworld.com/45634](http://find.pcworld.com/45634) to download your copy.

## Security Template Scorecard

Compare Windows' security settings with the Security Configuration and Analysis templates by interpreting the tool's Policy icons.

ICON OVERLAY	Meaning
	Your current settings match those in the database template.
	Your current settings don't match those in the database template.
	Your setting was not found in the template and could not be analyzed.
	The setting exists in the database template but not on your system.

log file, or click *OK* to accept the default path. When the tool finishes applying the settings, repeat the analysis. You should now see fewer red circles with X's, since your system settings should match those in your current database.

Test your network and Internet connections, as well as your e-mail and any other applications that may have been affected by the change. If any problems occur, restore the Registry as explained at [find.pcworld.com/45580](http://find.pcworld.com/45580) and try again. ■

Send Windows-related questions and tips to [scott\\_dunn@pcworld.com](mailto:scott_dunn@pcworld.com). We pay \$50 for published items. Visit [find.pcworld.com/31607](http://find.pcworld.com/31607) for more Windows Tips. Scott Dunn is a contributing editor for PC World.





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Media Reader	8-in-1 Card Reader
System Cooling	Integrated Cooling Engine (ICE) Liquid Cooling
Operating System	Microsoft Windows XP Media Center Edition 2005
Dimensions (L x W x H)	12.2 x 7.8 x 7.2 (in); 310 x 200 x 185 (mm)

\* monitor not included



# G5 8300m

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# INTERNET TIPS

SCOTT SPANBAUER

THE TELLTALE  
SIGNS OF PHISH

UNCLOAK A PHONY  
WEB SITE URL

THE FREE NVU  
WEB-EDITING TOOL

## Paranoia: The Best Defense Against E-Mail Attacks

I LOVE THE Toshiba laptop I bought last year. I keep just about everything related to work, school, and my finances on it. So when I received an e-mail from Toshiba warning that my model may have a data-threatening memory defect, I was anxious to find out whether my machine was affected. A link in the message took me to a Toshiba Web page, which promised to download a utility to my PC that would check for a defective memory module. All I had to do was click one button.

But just as I was about to click that button, a doubt bubbled up from the depths of my digital credulity. Could the whole thing be a scam? Was I about to download and install a Trojan horse, backdoor program, or worm? As it turned

column ([find.pcworld.com/45668](http://find.pcworld.com/45668)). This month I'll troll a little deeper and point out particular differences between a genuine message and a bogus one.

### DON'T TAKE THE BAIT

IF YOU KEEP just this one thing in mind, you'll protect yourself from the majority of e-mail attacks: Assume any message

pany won't be sending you any account-related e-mail. But even messages that appear to come from firms you have an account with may not be real. Remember, your new motto is Trust No One.

Before clicking a link or taking any action requested in a message, determine for certain that the message is genuine. Return addresses, embedded links, and images can deceive. Look for dire warnings and other classic con techniques, undoubtedly accompanied by a link to a bogus Web site where you'll be asked to enter personal information (see **FIGURE 2**).

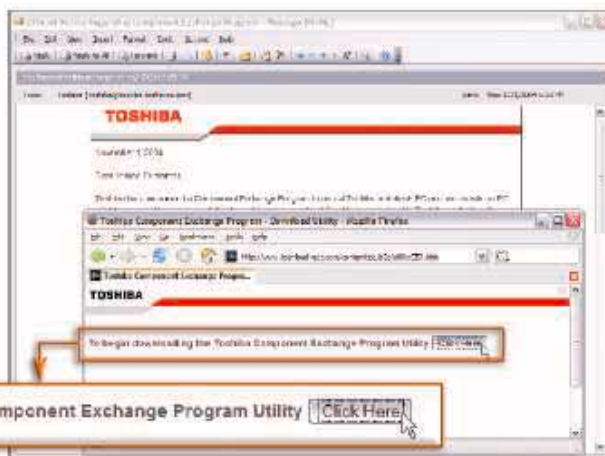
Note the similarities between the two messages shown in Figure 2: Both are text-based, reasonably well written, and plausible (although the phishing message contains typos and poorly composed sentences with borderline illogic). Both also contain real addresses to each company's Web site (highlighted in blue by the e-mail program displaying them). The only difference is that the faux-Citibank message also has a link to a short-lived

phishing site where the unsuspecting visitor is asked to enter personal information. Rather than providing a link to a specific page, genuine messages from companies that are savvy to phishing and other online fraud will generally instruct you to visit or log in to the company's main Web site.

Another clue: The phishing message may be delivered to an e-mail address that you don't use with that company or institution. Note that I received the phishing message at a widely publicized (and indexed) address ([nettips@pcworld.com](mailto:nettips@pcworld.com)); the genuine PayPal message came to my personal address, which I had previously verified with PayPal. If you get a message at an address you never registered with the company, it's fake.

### KNOW YOUR LINKS

INTUITION AND A suspicious nature are a good start, but to separate real messages from bogus ones, you also need to decipher their Web addresses. In the two text-



**FIGURE 1: THIS TOSHIBA E-MAIL message and Web site turned out to be real, but they could have just as easily been a scam.**

out, it wasn't a trick: Toshiba really did send out an e-mail containing an embedded link leading to an executable file download located at a long, complex Web address (see **FIGURE 1**). Trouble is, phishing exploits, browser hijackers, and other online scams often hook their victims by using similar-looking e-mail messages.

Fortunately, you can learn to spot these e-mail cons by using a handful of investigative techniques and a boatload of common sense. I explained some basic stratagems back in last August's *Internet Tips*

could be malicious. It matters not who the sender appears to be, or whether the message's corporate logos, artwork, and embedded links look authentic. It's a trivial matter for scam artists to create fake messages that contain return addresses, images, and URLs lifted from the real company's own Web site.

Next, use your newfound paranoia to examine messages critically. If you don't have an account with Citibank, the com-



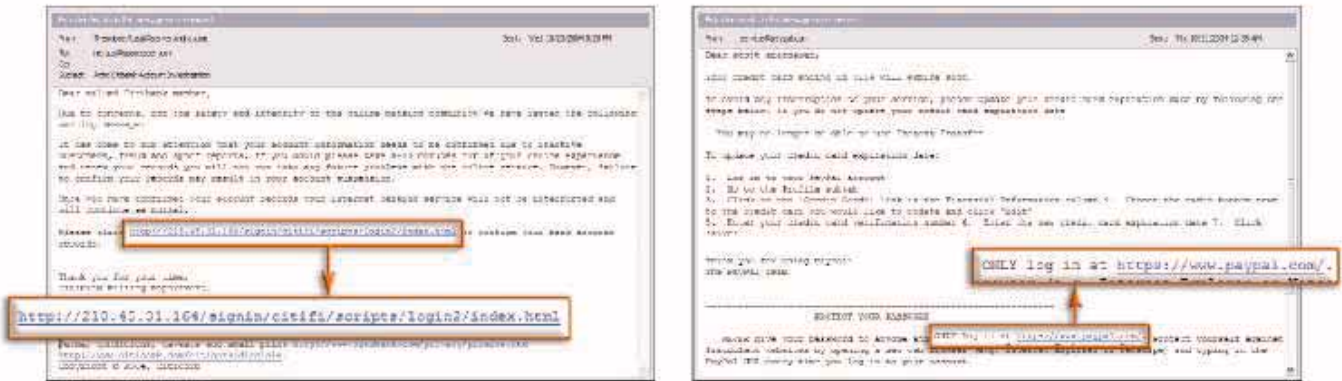


FIGURE 2: WHICH IS PHISH? The message on the left has a link to a now-defunct phishing site; on the right is a genuine missive from PayPal.

based messages above, all addresses are plain text, so what you click is what you get. Clicking “<https://www.paypal.com>” takes you to the real PayPal Web site. But clicking “<http://218.45.31.164/signin/citibank/scripts/login2/index.html>” doesn’t lead to a Citibank Web site.

One clue is the string of numbers following the URL prefix “<http://>”. Every Web site resides at a specific Internet Protocol (IP) address, so, for example, you can get to the PCWorld.com site by typing **65.220.224.30** in your browser’s address bar instead of “[www.pcworld.com](http://www.pcworld.com)”. However, “218.45.31.164” doesn’t lead to the Citibank Web site, even though the rest of the address looks like other links you may routinely click. The only way you can be sure to reach the real Citibank site is to type the domain-name-based URL **www.citibank.com** into your browser’s address window manually. (And once you do, be

sure to click the *Consumer Alert* link that describes these fraudulent e-mail messages.) If you’re not sure where an IP address leads, don’t click it.

Substituting a numeric IP address for a domain name in a URL isn’t the only way a malicious message will try to trick you. The address “[www.citibank.com](http://www.citibank.com)” is the real deal, but “[www.citibank.phishing.com](http://www.citibank.phishing.com)” could lead anywhere. Every domain name ends with a top-level domain (TLD), like .com, .org, .edu, or a country-specific TLD such as .cn (China), .uk (United Kingdom), or .ru (Russia). The word just to the left of this TLD, together with the TLD portion, spells out the actual domain name: “[citibank.com](http://www.citibank.com)”, for example, is all it takes to get to Citibank’s site. When a phisher modifies a domain name slightly, or inserts a word to the left of the TLD, the name changes. Phishers hope that you won’t know or notice the difference

between “[pcworld.com](http://pcworld.com)” and “[pcworld-gotcha.com](http://pcworld-gotcha.com)” or “[pcworld.phishing.com](http://pcworld.phishing.com).”

E-mail attacks can also use the Web format itself to conceal the true destination of links. If a message is composed using HTML, the highlighted link text may not be the same as the actual embedded link. This was true of the e-mail I received from Toshiba and was one reason I became suspicious of its origin. Most e-mail programs display an embedded link’s underlying URL in the bottom status bar or in a pop-up window when you hover the mouse pointer over it.

### THE SAFE WAY TO A SITE

I NEEDED TO FIND OUT whether the message was genuine; if it was, I would have to test my beloved laptop for a faulty memory module. First I entered a likely Toshiba site URL—“[toshiba.com](http://toshiba.com)”—into my browser’s address bar; this move transported me to a global Toshiba site. (See “Privacy Watch” on page 35 for an even safer approach.) After rummaging around awhile, I finally stumbled upon a Web page describing the same issues noted in the Toshiba e-mail, and using the same URLs. Voilà! I had my confirmation—the Toshiba e-mail was truly legitimate. But I still never clicked the message’s embedded link, going instead through the link on the company’s Web site. You can never be too careful. ■

Send your questions and tips to [nettips@spanbauer.com](mailto:nettips@spanbauer.com). We pay \$50 for published items. Go to [find.pcworld.com/31523](http://find.pcworld.com/31523) for more Internet Tips columns. Scott Spanbauer is a contributing editor for PC World.

### DOWNLOAD OF THE MONTH

## Nvu Brings Free Web Authoring to the Firefox Browser

ALL THE WORLD IS SINGING the praises of the Mozilla Foundation’s Firefox Web browser (visit [find.pcworld.com/45876](http://find.pcworld.com/45876) to read my review from last month’s issue). Unlike the monolithic Mozilla suite, Firefox is modular, splitting such elements as e-mail off into standalone programs. But one key module still missing in Firefox’s initial release is Mozilla’s Composer graphical Web authoring tool. Though a final version is still far off, Firefox converts can already use the beta version of what will undoubtedly become the successor to Composer, currently called Nvu ([find.pcworld.com/45670](http://find.pcworld.com/45670)).

Despite some rough edges (the program is still in version .70), Nvu improves notably on the venerable Composer while still maintaining that program’s basic interface and organization. Nvu allows you to work on multiple Web sites at one time using a tabbed interface, and you can edit sites right on the Web server. Web developers looking to streamline their pages will appreciate Nvu’s Cascading Style Sheets editor, as well as the program’s HTML markup cleaner that strips away superfluous or empty HTML tags. And of course, it’s free.

# HARDWARE TIPS

KIRK STEERS

## Keep the Output Flowing From Your Laser Printer

PERSONAL LASER PRINTERS combine the economy and print quality of their more expensive enterprise counterparts with the price of an inkjet. Personal lasers lack an IT department to keep them running, however. Here's how to solve problems that may plague your laser printer.

**Ask Mr. Wizard:** The Windows Printing Troubleshooter wizard focuses on basic problems, but it's well worth trying. In Windows XP, choose *Start•Help and Support*, type **list of troubleshooters** in the Search box, and press **<Enter>**. Click *list of troubleshooters* in the left pane, select the *Printing* troubleshooter from the list on the right, and follow the steps. In Windows 2000, click *Start•Help*, and choose *Troubleshooting and Maintenance* on the Contents tab. Select *Windows 2000 troubleshooters*, click *Print* in the list of troubleshooter wizards in the right pane, and follow the steps. To open the wizard in Windows Me, click *Start•Help*, type **troubleshooter** in the Search box, and click *Go*. In Windows 98, select *Start•Help•Contents•Troubleshooting•Windows 98 Troubleshooters•Print*, and follow the wizard.

**Check the basics:** If your printer is plugged in but doesn't power up, look at the fuse or circuit breaker on the surge suppressor that your printer is plugged into. Reseat both ends of the USB or parallel cable that connects your printer to the PC. Many laser printers have an online/offline control on the front panel that may have been bumped inadvertently.

**Print a test page:** Most printers can run a self-test if you hold down one or more buttons on the control panel while the unit powers up. If the test page looks good, then the problem lies with your

data cable, PC, or software. If the printout doesn't look right, see the chart below for a list of common problems and solutions.

**Get the latest:** Install the newest driver and firmware for your printer. Both should be available from the maker's Web site. To install a new driver in Windows XP, select *Start•Printers and Faxes* and choose *Add a Printer* under Printer Tasks on the Explorer bar in the 'Printers and Faxes' window. In Windows 2000, Me, and 98, remove the printer's driver and reinstall it: Select *Start•Settings•Printers* to open the Printers window. Right-click the printer, select *Delete* (choose *Yes* if you're asked to verify the removal), open the Printers window again if it closed, double-click *Add Printer*, and complete the reinstall.

**Stop jam sessions:** Always remove any

jammed paper by pulling it in its normal direction of motion through the printer. If your printer chronically jams, unplug it, let it cool down, remove its toner cartridge, and examine the interior for any debris that may impede paper movement.

**Check your connections:** If your printer uses a USB connection, open Device Manager and look for a red X or an exclamation mark in a yellow circle next to any of the USB device listings: In Windows XP, 2000, and Me, click *Start*, right-click *My Computer*, and select *Properties•Hardware•Device Manager*. In Windows 98, right-click *My Computer* and choose *Properties•Device Manager*. These icons can signify a problem with your printer's link to your PC. If your printer stops working when your system comes out of hibernate or suspend mode, double-click each root hub listed under USB, select *Power Management*, and uncheck 'Allow the computer to turn off this device to save power'. If you're using a USB hub, see whether connecting the printer directly to the USB port on the PC solves the problem. ■

Go to [find.pcworld.com/31511](http://find.pcworld.com/31511) for past Hardware Tips columns. Send your tips and questions to [kirk\\_steers@pcworld.com](mailto:kirk_steers@pcworld.com). We pay \$50 for published items. Kirk Steers is a PC World contributing editor.

### Common Laser Printer Problems

HERE ARE FIXES for the most common laser printer maladies.

PROBLEM	Cause	Solution
Light print or uneven print density across the page	The toner is low.	Take out the cartridge and gently rock it to redistribute the toner.
Small white spots	The toner isn't sticking to the paper; the paper may also be too thick or moist.	Try a different paper.
A vertical black line on the edge of the page	The toner cartridge is empty or faulty; or toner may have spilled inside.	Replace the toner cartridge.
All-black page	The charger corona wire is faulty.	Remove and reinsert the toner cartridge. If that doesn't work, replace the cartridge.
All-white page	The toner is low, or the transfer corona wire is faulty.	Check the toner level; a transfer corona wire problem requires repair servicing.
Offset margins, strange spacing, or unusual text alignment	The document or image is too large for the available print area.	Check the Unprintable Area settings on your printer driver's Paper tab.
Only part of an image prints	The printer has run out of memory.	Add memory to the printer or lower the print resolution.



# STEP BY STEP

DAVE JOHNSON

## Eight Easy Ways to Soup Up Your Slide Shows

SLIDE SHOWS ARE an extremely popular way to share digital photos because they replicate the old-time experience of gathering 'round a 35mm slide projector and

gazing at images on a portable screen—only now you can watch your slides while sitting in front of your television or computer display. Microsoft's Windows XP

operating system comes with all the tools a person needs to create, play, and save a serviceable (though admittedly somewhat pedestrian) slide show.

If Windows' meager tools leave you longing for more bells and whistles to tinker with, however, we'll show you how to put together a pull-out-all-the-stops slide show—one that includes transitions, captions, sound tracks, and other effects—using Roxio's \$75 Easy Media Creator 7 ([find.pcworld.com/45874](http://find.pcworld.com/45874)), a program you may already use for burning CDs. ■

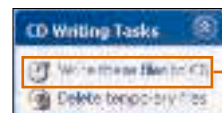
Dave Johnson writes the Digital Focus online newsletter for PCWorld.com. To sign up for it, visit [find.pcworld.com/41135](http://find.pcworld.com/41135).

### THE WINDOWS WAY

**1 Keep it simple:** To make a rudimentary slide show in Windows XP, just open your My Pictures folder or any folder holding your photos. Then choose *View as a slide show* in the Picture Tasks list in the pane on the left side of the screen (A).



**3 Share it on CD:** To export your slide show to other XP users, put the pictures in a folder and click *Copy to CD* in the Picture Tasks pane (B). Next, put a disc in your CD-RW drive, and double-click the drive's icon in My Computer. In the CD Writing Tasks pane, click *Write these files to CD* (C). The slide show will play automatically when the disc is reinserted in a drive.



**2 Change speed:** The pictures in that folder display at full-screen size, one at a time; by default, they advance every 5 seconds. If you're trying to narrate a slide show and find that the images change too quickly, simply move the mouse pointer to the top-right corner of the screen and click the pause button in the controls that appear.

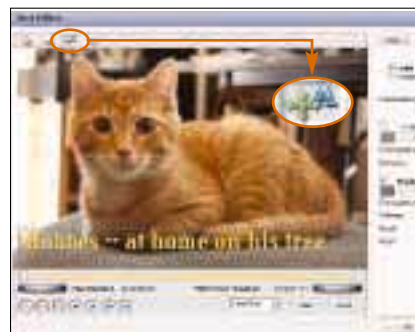
**4 Play it on TV:** The easiest way to play your slide show on a TV is to plug your PC into your TV set's S-Video port. Or if your camera has a video connection cable, plug the camera into your PC and copy the slide-show pictures to your camera's memory card. Then plug the camera into your TV and use the camera's playback controls.

### SPICE IT UP WITH ROXIO

**1 Add pictures and video:** Open Easy Media Creator 7 and click *Create slideshow*. To choose content for your slide show, select the folder holding the pictures you want to use and drag the images to the Storyline at the bottom of the Media Selector screen. Roxio lets you add video clips as well as pictures to your slide show, so feel free to drag any one of those short videos that your camera records into your slide show the same way you would add a still shot.



**3 Add titles and captions:** To pick a text style, click the text icon on the Media Selector toolbar. Drag your choice of style to a slide in the Storyline to open the Text Editor. Enter your text, click the Path tab, and use its controls to make text fade in or out, or fly around. To add a caption to a screen, click the text lock in the top-left corner of the Text Editor, and then position the text where you want it to go.



**2 Apply a sound track:** To add an .mp3, .wma, or other digital music file to your slide show, drag the track to a space between pictures in the Storyline. Note that if you place the file on a particular picture, your music will play only while that photo is being shown.

**4 Finish with transitions:** Click Easy Media Creator 7's transitions button to find dozens of effects you can drag from the Media Selector to the transition icons between pictures in the Storyline. Double-click any transition in the Storyline to change its duration.

## ANSWER LINE

LINCOLN SPECTOR

# Clean Up Your Hard Drive After Upgrading Windows

**?** After installing Windows XP Service Pack 2, I found folders inside C:\Windows with such names as "\$NtUninstallKB810217\$". Each holds more than 800MB of files. Can I get rid of them?

Ibrahim A. Al-Harun  
Chittagong, Bangladesh

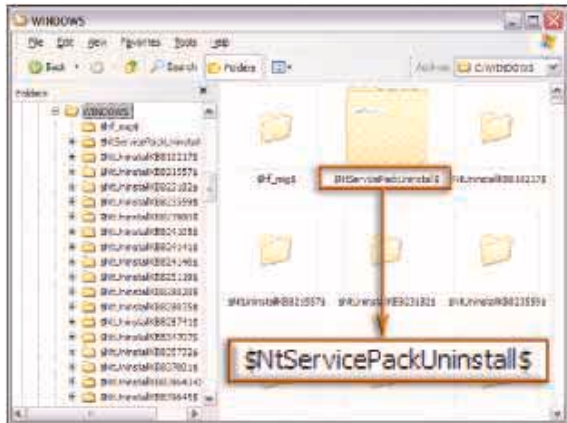
WHEN YOU UPDATE Windows 2000 or XP, the update program often saves uninstall information to a folder such as the ones you describe. If you're sure you want the update, remove its uninstall folder.

To see your PC's saved uninstall fold-

ers, open Windows Explorer to C:\Win-

dows (in Windows XP) or C:\WINNT (in Windows 2000); you may need to click *Show the contents of this folder*. If you don't see any folders, select **View•Folder Options**, click the **View** tab, select *Show hidden files and folders*, and click OK.

The Windows Service Pack uninstall is in the folder \$NtServicePackUninstall\$ (see **FIGURE 1**). Others are named \$NtUninstallKBnnnnnn\$ or \$NtUninstall-



**FIGURE 1: SAVE DISK SPACE BY DELETING the uninstall folders of old Windows updates you're sure you want to keep.**

ers, open Windows Explorer to C:\Win-

dows (in Windows XP) or C:\WINNT (in Windows 2000); you may need to click *Show the contents of this folder*. If you don't see any folders, select **View•Folder Options**, click the **View** tab, select *Show hidden files and folders*, and click OK.

There's no universal method for turning all of these "helpers" off, but I'll outline a couple of ways to deactivate the most common of the pop-ups.

To turn pop-up windows off in Word, Excel, and other Microsoft Office applications, select **Tools•Customize•Options**, uncheck *Show ScreenTips on toolbars*, and click *Close*. You'll have to repeat this pro-

cedure in every Office application where you don't want tips to pop up.

If you don't want to be told what icon you're pointing to when you're in Windows Explorer or on the desktop, open Explorer or any folder window and select **Tools•Folder Options•View**. Scroll to the bottom of the Advanced settings list, and uncheck *Show pop-up description for folder and desktop items*. Click OK.

## SHORTCUT TO MSCONFIG



How do I put a shortcut to the System Configuration Utility (msconfig) on my Start menu so I don't have to type "msconfig" in the Run box?

Leslie D. Waters, San Jose, California

RIGHT-CLICK the desktop and select **New•Shortcut** to start the Create Shortcut wizard. In the 'Command line' field, enter **msconfig** (in Windows 98 and Me), or **c:\windows\pchealth\helpctr\binaries\msconfig** (in XP). (Note that Windows 2000 lacks the System Configuration Utility.) Finish stepping through the wizard, making your own choices. Once you have the shortcut on your desktop, simply drag it to your Start menu.

Send your questions to [answer@pcworld.com](mailto:answer@pcworld.com). Answer Line pays \$50 for published items. See [find.pcworld.com/31577](http://find.pcworld.com/31577) for more Answer Line columns. You'll find Contributing Editor Lincoln Spector's humorous and other writings at [www.thelinkspector.com](http://www.thelinkspector.com).

## NO POP-UP HELP



Can I disable those annoying descriptions that pop over whatever I'm pointing at?

Robert Horton

Gig Harbor, Washington

THESE SMALL pop-up windows go by a number of

names: Tooltips, InfoTips, ScreenTips, and balloon help (the generic name). There's no universal method for turning all of these "helpers" off, but I'll outline a couple of ways to deactivate the most common of the pop-ups.

To turn pop-up windows off in Word, Excel, and other Microsoft Office applications, select **Tools•Customize•Options**, uncheck *Show ScreenTips on toolbars*, and click *Close*. You'll have to repeat this pro-

## CDs BLOCK WIRELESS

IS THE SIGNAL STRENGTH of your home's wireless network less than it should be? Is the notebook in one room unable to make contact with the desktop in the other? Reader Don Jones discovered a surprising cause of this problem in his own home: his CD collection. "Those culprits are made from a thin sheet of a metallic substance sandwiched between a couple of layers of plastic. CDs are basically big signal reflectors, making them as reflective of radio signals as they are of light." By moving his CDs away from the network's operating area, he was able to improve his 802.11g network considerably.



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## Smart Software: It's Still Stupid

WHO'S SMARTER—you or your software? Software inevitably thinks the answer is "Me!" because it's too stupid to know better. If software were a person, it would be a big, arrogant, passive-aggressive sociopath who pretends to be helpful but actually couldn't care less about anyone else.

So sorry, Microsoft, but I don't want you to upload all 80 gazillion kilobytes of Windows XP Service Pack 2 automatically—especially when I'm stuck in a hotel and trying to download my e-mail over a slow dial-up line. Nor do I want Windows XP's lame "indexing service" to churn my disk in the background while I'm working on cycle-intensive video. Or at any other time, for that matter.

### WHO'S THE BOSS?

SMART SOFTWARE? No thanks, developers. I don't want Windows hiding file-name extensions or underused menu items because you think I'm too dumb to understand them. I don't want Office formatting my documents with bullet points I never intended. And I don't want inexplicable slowdowns that cut my productivity because something I don't know about is running automatically in the background to keep itself on life support.

I'd also like the illusion that it's my machine, not yours. Norton AntiVirus, I'm talking to you: As I was downloading a very big file recently, up popped a message saying the program needed to reboot my computer—but offering only a big restart button, not one that let me say "wait until I'm good and ready." I simply left it up on the screen and ignored it.

While I was talking on the phone, however, I noticed a close box in the upper-right corner of the dialog box. Under the

baleful influence of multitasking, I guessed that closing it must be the equivalent of ignoring it, with the added benefit of getting it off my screen.

But the minute I clicked the red X, the machine began shutting down, knocking me offline and aborting the download.

More and more often, software pretends to know what's best for you—and then gets it wrong. Spam is making e-mail an increasingly unreliable form of communication, due in part to our reliance on not-smart-enough software filters that let junk through and whack legitimate messages. And far too much software that wants a high-speed Internet connection assumes that

my notebook has one when it doesn't.

Unfortunately, it's no longer possible for most people to deautomate their computing lives. Antivirus and anti-spyware programs have to phone home for new definitions, and desktop search programs have to keep their indexes up-to-date—and you'd probably get tired of it if they asked for permission every single time. Firewalls have to make good guesses about what's legitimate and what's not. And when they do ask for your help, you may not be qualified to give it.

Software needs to realize that it's never going to be the only program running on your machine—and that it is not as smart as it likes to think it is. ■

Visit [find.pcworld.com/31595](http://find.pcworld.com/31595) to see additional columns by Contributing Editor Stephen Manes. He has been writing about technology for two decades.

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